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Smart Governance: Kashiwa-no-ha Smart City in Japan as a model for future urban development?

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Die Feldarbeit in Kashiwa-no-ha fand im Rahmen eines LabExchange zwischen dem Lehrstuhl Urban and Metropolitan Studies der RUB (Frau Prof. Dr. Hohn) und der Arbeitsgruppe von Frau Prof. Dr. Fujii, Division of Policy and Planning Sciences, Faculty of Engineering, Information and Systems der Universität Tsukuba statt, finanziert über das inSTUDIES-Programm der RUB.

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Vorwort

Die Entwicklung von Smart City Ansätzen ist seit vielen Jahren ein zentrales Handlungsfeld der zukunftsfähigen Stadtentwicklung. Auf der einen Seite stehen Smart Cities für einen vielfältigen Experimentierraum für technische Innovationen bzw. für einen digital basierten Steuerungsansatz vernetzter Infrastrukturen. Auf der anderen Seite betonen Kritiker und Kritikerinnen den verengten Technologiefokus von Smart Cities sowie das bedrohliche Potenzial zunehmender sozialer Kontrolle durch digitale Technologien.

Dies ist der Diskussionsrahmen, an dem die Masterarbeit von Markus Gornik ansetzt. Deren Zielsetzung besteht darin, die Qualität des Steuerungsprozesses am Beispiel der japanischen Smart City Kashiwa-no-ha analytisch aus geographischer Perspektive zu erfassen und zu bewerten. Herr Gornik untersucht eine wichtige soziale Dimension des Steuerungsprozesses: Müssen mit den Möglichkeiten einer Smart City Städte nicht nur neu gedacht und geplant werden, sondern erfordern Smart Cities nicht auch neue Steuerungs- und Governanceerfordernisse? In welcher Weise heben sich diese von traditionellen Planungs- bzw. Steuerungsansätzen ab? Und: In welcher Weise kann die Qualität von Steuerungsprozessen überhaupt methodisch erfasst und bewertet werden?

Unter Berücksichtigung der beschriebenen Problemstellung operationalisiert Herr Gornik das geographische Konzept seiner „Smart Governance“. Als zentralen methodischen Referenzpunkt entwickelt Herr Gornik hier ein eigenes Bewertungssystem, das er in fünf Handlungsfelder strukturiert: Social Justice, Social Innovation, Social Learning, Social Empowerment und Social Resilience. Mit insgesamt 14 Indikatoren macht Herr Gornik die fünf gewählten Handlungsfelder analytisch erfassbar.

Herr Gornik kommt zu dem Ergebnis, dass auf Basis der vorgelegten Definition von Smart Governance das Fallbeispiel nicht eindeutig als Vorbild für die zukünftige Stadtentwicklung dienen kann. Einerseits ist die starke Rolle der Wissenschaft im städtebaulichen Kontext von Kashiwa-no-ha beispielhaft und hat zu einer innovativen Kollaborations- und Diskussionskultur zwischen Akteuren der japanischen Stadtentwicklung geführt. Auf der anderen Seite gibt es in mehreren der untersuchten Handlungsfelder deutlichen Verbesserungsbedarf, bspw. im Bereich der Sozialkapitalbildung und der Fortführung eines sozialverträglichen Reallaboransatzes.

Mit ihrem besonderen Zugang ist der Arbeit ein hoher Innovationsgrad und ein wichtiger Beitrag in der zukünftigen Entwicklung von Smart Cities zuzuschreiben. Es bleibt allerdings weiter ein offenes Forschungsfeld, in welcher Weise Smart City Ansätze neue Steuerungserfordernisse auf kommunaler und regionaler Ebene nach sich ziehen.

Wuppertal, Essen, 29. Januar 2020

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Kurzfassung

Da urbane Prozesse Leitmodelle zukünftiger Städte (sogenannte “travelling concepts”) benötigen um ihre Entwicklung voranzutreiben, untersucht diese Masterarbeit, ob die "am Reißbrett“ entworfene Smart City Kashiwa-no-ha in Japan, die praktische Governance mit einem urbanen Reallaboransatz verbindet, als ein solches Modellkonzept fungieren kann. Ausgehend von einer sozio-geographischen Governanceperspektive auf Stadtentwicklungsprozesse, leitet der Autor eine eigene Definition des „fuzzy concepts“ der Smart Governance innerhalb der Smart City-Vision ab – fortlaufend als Smart Urban Governance bezeichnet. Hierfür entwickelt der Autor einen Indikatorenkatalog für die Operationalisierung dieser Smart Urban Governance und wendet diese auf das japanische Fallbeispiel an. Methodisch verfolgt die Masterarbeit dabei einen qualitativen Ansatz und führt in diesem Zusammenhang sowohl eine deskriptive als auch eine normative Governance-Analyse am Beispiel von Kashiwa-no-ha durch. Als Datengrundlage dienen hierfür neben der vorhandenen Literatur zum Themengegenstand vor allem die empirischen Erhebungen des Autors.

Die Masterarbeit kommt zu dem Ergebnis, dass die starke Rolle der Wissenschaft beim „community building“ im städtebaulichen Kontext von Kashiwa-no-ha beispielhaft ist und zu einem kooperativen Verhaltenskodex zwischen den traditionellen Akteuren, vermittelt durch eine öffentlich-privat-akademische Zusammenarbeit, sowie zu einer Ko-Innovation zwischen der Stadt, den Entwicklern und den Bürgern in Form einer öffentlich-privat-zivilen Partnerschaft geführt hat. Obwohl das Vorzeigeprojekt eine große Anzahl der in diesem Zusammenhang definierten Indikatoren für Smart Urban Governance voll erfüllt, besteht auch Verbesserungspotenzial. Zum Beispiel in Bezug auf die Partizipation, Transparenz, Integration sowie die Bereitstellung öffentlicher, aneignungsfähiger Räume. Da sich die Kashiwa-no-ha Smart City noch bis 2030 in der Umsetzungsphase befindet, schließt die Arbeit mit einer Prognose sowie mit einer Handlungsempfehlung auf Basis einer Stärken-Schwächen-, Chancen- und Gefahrenanalyse (SWOT) ab.

Abstract

Since urban processes need models of possible futures (referred to as travelling concepts) to drive their development, this study investigates whether planned-from-scratch smart city Kashiwa-no-ha International Campus Town Initiative can produce such an image with its smart governance approach, that is combined with an urban living lab. Using geographical governance research in relation to urban development processes as a framework, this master's thesis derives its own definition of the fuzzy concept of smart governance within the smart city vision based on a socio-geographical understanding of space, here referred to as Smart Urban Governance. Additionally, a set of indicators for the operationalisation of Smart Urban Governance is designed and applied to the case study. Methodologically, the thesis pursues a qualitative approach and, in this context, carries out a descriptive and normative governance analysis of Kashiwa-no-ha on the basis of the existing literature and empirical surveys conducted by the author.

In summary, the strong role of academia in the urban planning context of community-building in Kashiwa-no-ha is exemplary and has led to a collaborative code of conduct between the traditional actors, mediated by a public-private-academic partnership, as well as to co-innovation between the city, developers, and citizens in form of a public-private-people partnership. Although the flagship project successfully addresses a large number of the Smart Urban Governance indicators defined in this context, there is potential for improvement, for example, in terms of participation, transparency, inclusion, and public spaces. Since Kashiwa-no-ha Smart City is still in an implementation phase until 2030, the thesis concludes with a forecast and a recommendation for action based on a strengths, weaknesses, opportunities, and threats analysis.

Contents

List of Abbreviations and Planning Terms

Abbreviations

AI	Artificial Intelligence
BBA	BigBrotherAward
BBSR	Federal Institute for Research on Building, Urban Affairs and Spatial Development
BMUB	Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety
CO_2	Carbon Dioxide
E	Electronic
EU	European Union
FCI	Future City Initiative
ICT	Information and Communication Technology
IoT	Internet of Things
KOIL	Kashiwa-no-ha Open Innovation Lab
LR	Land Readjustment
METI	Japanese Ministry of Economics, Trade and Industry
MF	Mitsui Fudosan Co., Ltd.
MLIT	Japanese Ministry of Land, Infrastructure, Transport and Tourism
NGO	Non-Governmental Organisation
NPO	Non-Profit Organisation
PDC	Portland Development Commission (now Prosper Portland)
PPAP	Public-Private-Academic Partnership
PPPP	Public-Private-People Partnership
SDG	Sustainable Development Goal
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TMG	Tokyo Metropolitan Government
TX	Tsukuba Express
UCA	Urban Control Area
UDC	Urban Design Center
UDC2	Urban Design Center Kashiwa Station
UDCK	Urban Design Center of Kashiwa-no-ha
UN	United Nations
UPA	Urban Promotion Area
UR	Urban Renaissance Agency
WACOSS	Western Australian Council of Social Services
WBGC	We Build Green Cities
WIFI	Wireless Fidelity
ZGF	Architect Group from Portland

Japanese Planning Terms

Desakota	Urban sprawling: Areas in the extended surroundings of large cities, in which urban and agricultural forms of land use and settlement coexist and are intensively intermingled
Dokuritsu gyōsei hōjin Toshi saisei kikō	Urban Renaissance Agency, a semi-public institution responsible for Japanese housing.
Edo jidai	Edo era (1601-1867)
Honne	Real intention, motive, true opinion, what one really thinks (private thoughts)
Ippan Shadan Hōjin	General Incorporated Association (In 2006, Japan enacted a series of new laws regarding non-profit entities which came into effect December 2008)
Jūmin jichi	Resident self-administration
Jūmin undō	Resident movement
Kisei-kanwa	Deregulation
Machizukuri	Literally: urban design, community development (planning at the micro level with a bottom-up approach)
Machizukuri benkyōkai	Machizukuri learning group
Machizukuri kyōgiaki	Machizukuri conference
Meiji jidai	Meiji era (1868-1912)
Machizukuri Kyôgikai	Community-building Council
Midori no Kikin	Fund for Green
Sankagata-machizukuri	Machizukuri based on resident participation
Shigaichi ken-chikubutsu hō	Japanese Urban Building Law (1919)
Shigaika kuiki	Urbanization Promotion Area
Shigaika chōsei kuiki	Urbanization Control Area
Shin toshi keikaku hō	New Urban Planning Law (1968)
Shōwa jidai	Shōwa era (1926-1989)
Tatemae	Official stance, public position, attitude (as opposed to private thoughts)
Tochi kukaku seiri hô	Land Readjustment Act (1954)
Toshi keikaku	Urban Planning (Expert planning based on western planning systems in a top-down process)
Toshi keikaku hō	Japanese City Planning Law (1919)

Shigaika chosei kuiki	Urban Control Area
Shigaika kuiki	Urban Promotion Area
Yatai	Food cart, stall, stand

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1 Introduction

Last year, the negative prize for BigBrotherAward (BBA) 2018 in the category of PR & Marketing was awarded to the smart city concept. Every year, the BBA foundation awards prizes to countries, authorities, companies, organisations, individuals, and even concepts that have impaired the privacy of individuals in a special and lasting way or have made personal data accessible to third parties. From the jury's point of view, the smart city concept promotes safe city, a completely monitored, remote-controlled, and commercialised city paved with sensors. This would reduce its citizens to consumer status and turn them into data-supplying objects. The term smart city would be a dazzlingly colourful bag of wonders that would promise everyone what they want: Innovation and modern city marketing, efficient administration and citizen participation, sustainability and climate protection, safety and convenience and a permanently free parking space (Tangens 2018).

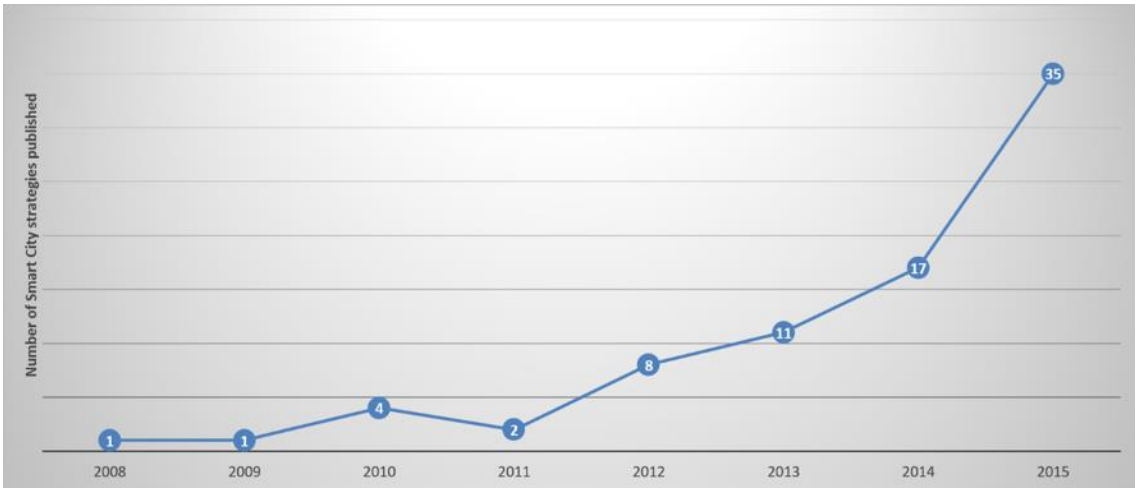

Figure 1 **Number of Smart City strategies planned by cities worldwide, 2008–2015 (Own representation after Berger 2017).**

This accusation is not unjustified, since, above all, negative examples from China, where concepts include an alien monitoring and social classification system (see Anderlini 2019) are more likely to be disseminated in the media than positive examples, such as SmartRebelCity (see Humann 2019). This development trend is unfortunate, especially when one considers that the original idea of a smart city was of a holistic, sustainable urban space for meeting the social, economic, and ecological challenges of people living in cities in the 21st century (European Commission 2017). What then happened? The holistic approach of the smart city makes it a so-called fuzzy concept. This means that there is no consensus on its significance and that the current smart city projects therefore differ in their planning implementation. At this point, could one criticize which smart city concept was meant by the BBA jury? It can be assumed, however, that the general implementation trend of the concept was being criticized. In order to counteract the development tendencies referred to above – not least because interest in smart city strategies is constantly growing (Fig. 1) – it is important to actively participate in the discourse on the smart city and its building blocks such as smart governance and to influence it by means of alternative concepts and the creation of new knowledge. Recent critical contributions not only draw attention to the problems of the smart city, but also call for the development of 'alternative smart city

stories' (Söderström/Paasche/Klauser as cited in Rosol/Blue/Fast 2018: 93). This is the aim of this thesis.

1.1 State of the Art and Problem Formulation

Urban Life, Jim – but not as we know it' is the subtitle of William J. Mitchell's book, E-Topia (1999) which started the debate on a paradigm shift in the kind of urbanity we have been experiencing so far. Starting from that point, in recent years, scientific discourse has produced the key concept of the smart city as a new model for future urban development, which has since been discussed, defined, and further developed by both interdisciplinary experts and the public. This fact makes the concept of the smart city a fuzzy concept with many different explanatory approaches and different focal points and perspectives. What these approaches have in common, however, is that they are about intelligent (digitally driven), efficient, and holistic solutions for the current and future challenges facing cities. These current and new challenges have been summarised in the Sustainable Development Goals (SDGs) and have recently been made applicable to the urban level by the New Urban Agenda (UN 2019).

In addition to the initially very technology-oriented approach, which often one-sidedly refers to technical aspects, such as the digitalisation of everyday life and efficiency increases through the use of new technologies (Jaekel 2015: 26), the current discourse on the smart city indicates that the concept must go beyond the use of information and communication technology (ICT) to make better use of resources and to reduce emissions and the resulting consumer data measurements and monitoring of residents. Jaekel's assumption is linked to the recognition that the technological aspects of the smart city cannot and must not be at the centre of the concept.

The focus on technology has long distracted from the more fundamental question: How do we want to live in the city of the future? Recently, people are moving more into the focus of the digitised city (see Bauriedl/Strüver 2018; Bolívar/Muñoz 2019 Humann 2019; Elmqvist/Bai/Frantzeskaki/Griffith/Maddox/McPhearson 2018; Schneidewind 2018). This brings the integrated function of the social sustainability dimension into focus in the smart city concept (see Caprotti/Yu 2018; Buckingham/Jepson 2014), that is, the dimensions are not considered in isolation from each other but in their interaction (see Hauff/Kleine 2009: 113). This has been further accompanied by a focus on governance as a central building block of this approach.

According to many experts (see Barns 2018; Bosch/Jongeneel/Rovers/Neumann/

Airaksinen/Huovila 2017; Hartemink 2016; Kogan 2014; Pereira/Parycek/Falco/

Kleinhans 2018), governance within urban development, as a procedure and consequence of collective decision-making and activity, has a steering role to play in the development of a smart city and hence for models of future urban development. In the discipline of geography, governance comprises 'the collective and institutionally anchored regulation of urban development processes from the micro level of a project area to the urban and regional level by various actors or decision-makers who are integrated into informal and formal, flexible and permanent networks with horizontal and hierarchical structures and specific power balances' (own translation of Hohn et al. 2006: 9).

As the smart city vision demands fundamental changes in how cities and urban spaces are thought of and organised, governance also needs to strive for new approaches within that vision. Scientific discourse has produced the key term 'smart governance', which is not less fuzzy than the concept on smart cities. However, due to the fact (as mentioned above) that a new governance approach should focus on the social sustainability dimension, digitalisation should only be the tool and not the goal of such a new approach. Therefore, it is crucial to define what exactly this new governance approach, that is, a smart governance approach, involves and how it can be operationalised to address the need for analytical instruments that will enable (smart) cities to record and measure the status of their grade of sustainability in these terms (see Schüle/Kaselofsky/Roelfes/Venjakob 2018). To support and strengthen this approach, images or models of possible futures should be provided that drive the development of urban processes (ibid.).

1.2 Case Study Approach

With the intention to address the demand for models of future urban development that foster the progress of integrated socially sustainable cities, this thesis presents a case study. In Asia, and especially in Japan, smart city projects are already far more established and advanced than, for example, in European countries such as Germany. The reason for this, according to Caprotti/Yu (2018: 1), is that the geography of urbanisation has shifted from the developed western world to the developing world of Asia due to demographic changes. Therefore, Asian urban development projects that confront key future challenges are not only central to Asian but to global urban development (ibid.: 2). Asian and, hence, Japanese urbanisation presents challenges that are context-specific but are also generalisable to other urban contexts, provided that the regional and national circumstances are considered. As smart cities are partly based on international standards such as the New Urban Agenda, it is even more probable that transferable insights can be from Japanese urban development projects. In this context, conducting a case study in these geographical latitudes is desirable.

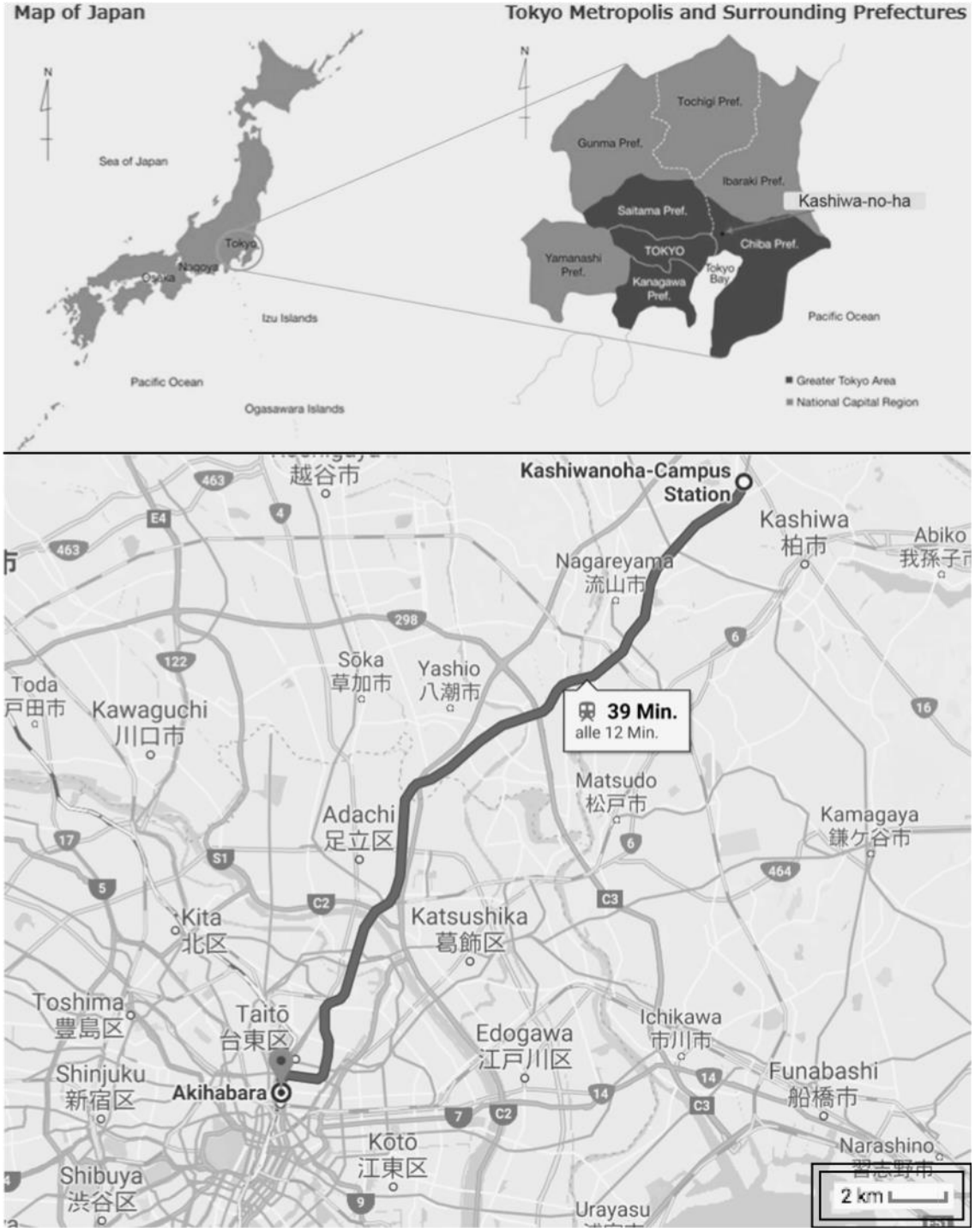

Figure 2 **Top: Schematic illustration (no scale) of Japan and the Tokyo Metropolitan Region with adjacent prefectures (TMG 2015). Bottom: Location of Kashiwa-no-ha Campus Station (Map data: Google, 2019).**

The smart city project Kashiwa-no-ha International Campus Town Initiative (afterwards described as Kashiwa-no-ha) is a planned-from-scratch flagship project (development began in 2005 and is to be completed by 2030) within Kashiwa City (which has more than 400,000 inhabitants) in Chiba Prefecture, located in the suburbs of the Tokyo Metropolitan Area (Fig. 2). Over the last 15 years, an innovative new town project has been established that applies an alternative cooperation con-

cept among the urban actors in order to develop a greenfield model city of sustainable and cooperative urban planning practice in the context of the smart city vision (Fig. 3). To this end, Kashiwa-no-ha established an Urban Design Center (UDCK), a public-private-academic partnership (PPAP) following the 'third mission' (promoting knowledge transfer between knowledge-based entities such as universities, non-profit organisations, etc. and civil society) leadership of the University of Tokyo, which has been functioning as a coordinating body for the project since 2006. The UDCK has already developed into a 'travelling concept' (urban planning concepts that have been developed and successfully implemented for the first time in the context of a specific project and then are used as a template by other projects and their stakeholders) within Japan. Furthermore, Kashiwa-no-ha Smart City strives for citizen empowerment with facilities such as the Kashiwa-no-ha Innovation Laboratory (KOIL), a public-private-people partnership (PPPP), which is a form of arrangement relevant for new governance approaches. With the intention to meet the demands of a model city, the Kashiwa-no-ha smart city pursues an urban living lab approach, in which travelling concepts from abroad are applied through international cooperation. Kashiwa-no-ha has been described as a signature city model and test bed of the national industrial strength of Japan and its national and international partners due to its creation of a new urban platform. In recent years, the project has focused primarily on machizukuri (community-building with a strong governance approach) and, accordingly, on integrated social sustainability (see Kurata/Ozasa/Ueno/Komatsu 2013: 236-237).

Figure 3 Skyline of Kashiwa-no-ha Smart City in Chiba Prefecture, Japan (Source: Hitachi 2017).

1.3 Research Interest and Key Questions

The investigation of a city planned from scratch according to the vision of a smart city can provide a clearer picture of the future of urban development and be the starting point for lessons learned and travelling concepts. Since such concepts have been tested for some time in Asia, it is likely that best-practice examples can be derived from there that may also be relevant for Europe, such as in Germany, where the smart vision is still in its infancy. The socially oriented dimension of a smart city does not play an important role in many smart city approaches in Japan; however, it is

one of the special features of the project that was selected as the case study (Trencher/Karvonen 2019: 263; Kurata et al. 2013: 241). Recently, in Europe too, greenfield smart city development projects have commenced. The latest example is the planned-from-scratch smart city in Oldenburg in Germany, which also incorporates an urban living lab approach (see Husman 2018). Nonetheless, the limited transferability of a concept city to a city in the existing stock must be taken into account. A greenfield smart city development integrated into an existing urban structure may have an impact on its surroundings.

From the theoretical perspective, this study fits into geographical governance research in the context of urban development processes and entails an analytical and normative approach with a socio-geographical spatial understanding as its basis. Therefore, the integrated perspective on the social dimension of the sustainability triangle (a common symbol that unites the various aspects of sustainability, consisting of ecology, economy and social issues, into a mutual triangular relationship) plays a vital role. This is explained in greater detail in Chapter 2.

As the fundamental research issue, this thesis aims to provide a definition of governance in the context of a smart city, so-called smart governance. Therefore, the thesis asks:

- How can smart governance within the fuzzy concept of a smart city be described and defined, and what differentiates it from traditional urban governance concepts?
- By means of which indicators can smart governance be operationalised to make it applicable to or verifiable in relation to smart city case studies?

In terms of the analytical approach, Kashiwa-no-ha in Japan is evaluated on the basis of the 'actor-centred institutionalism' analysis scheme (Chapter 3) in order to generate the necessary information for the indicator analysis. The governance analysis focuses on the following key questions as formulated by Hohn (Hohn/Reimer 2014: 325):

- What have been the development paths for establishing Kashiwa-no-ha?
- To what extent have traditional Japanese planning instruments been transformed in case of Kashiwa-no-ha?
- How is the network of actors in the example case structured and what special role do the new forms of cooperation, PPAPs and PPPPs, play?
- In relation to the Japanese planning system, to which formal and informal rules are the actors bound and how do they perceive themselves?
- Where is smart governance effective in terms of space?

Finally, to address the normative approach, a set of indicators for operationalising and verifying smart governance in the context of urban development is created based on the specific scientific literature and following the guidelines of Hauff/Kleine (2009: 166ff). Subsequently, the smart governance indicators are applied to the findings of the governance analysis to answer the main research question: Can Kashiwa-no-ha serve as a model for future urban development in terms of the definition of smart governance provided and its verifiable indicators?

Overall, this study aims to create new knowledge for the research field of geographical urban governance and to lay the foundation for further research. Furthermore, the findings can serve as feedback for the actors and experts involved in Kashiwa-no-ha as concerns their governance approach.

1.4 Structure

To this end, a catalogue of indicators for smart governance focusing on the integrated consideration of the social sustainability dimension in the context of smart cities, is compiled on the basis of current interdisciplinary scientific discourse (Chapter 2).

Chapter 3 presents the methodological basis for the empirical surveys, which were conducted in the form of on-site qualitative, guideline-based expert interviews, and for the case study analysis. The choice and implementation of the selected method is critically reflected on against the background of research in a foreign planning context.

In a subsequent step (Chapter 4), the concept of the case study is presented is analysed in relation to the catalogue of indicators using the 'actor-centred institutionalism' governance analysis scheme (Hohn/Reimer 2014: 325).

Chapter 5 comprises the results of the smart governance indicator analysis in order both to respond to the main research issue and answer the key questions. This is supplemented by a strategy recommendation based on a strengths, weaknesses, opportunities, and threats (SWOT) analysis. In addition, the validity of the results is critically reflected on and an outlook for further potential research is provided.

2 Smart Governance: Towards a Definition

The theoretical foundation of this study is a socio-geographical understanding of space in which spatial references are created by actors and are constructed by society (see Freytag 2013: 12). In the following, for the purpose to pursue a heuristic approach, the metatheory in which geographic governance research can be embedded is presented. Building on this, the traditional central objects of geographical governance research are defined as is what is now necessary to be added to these to speak of smart governance. The outcomes are operationalised by means of the indicators.

2.1 Will the real Smart City please stand up?

The Smart City is a normative concept of an intelligent, future-oriented city. Up to the present, discussions of the Smart City have mainly concerned visions of sustainability and technical possibilities. In general, in this context, the term 'smart' is usually associated with intelligent (mostly digitally driven) and efficient solutions for the current and future challenges of cities (Libbe 2014: 78), for example, demographic change, climate change, migration, and mega-metropolitan growth, in order to fulfil the demand for sustainable cities and communities.

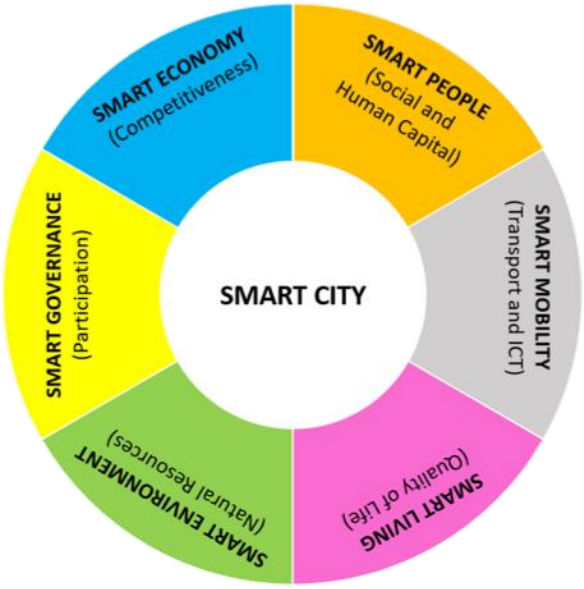

Figure 4 **Six characteristics of a Smart City (Own representation, adapted from Giffinger/Fertner/Kramar/Kalasek/Pichler-Milanovic/Meijers 2007: 12).**

Giffinger et al. (2007: 11) summarises the main goals or characteristics of smart city approaches: smart environment, smart mobility, smart economy, smart living, smart people, and smart governance (Figure 4). However, the scientific discourse has produced different opinions and ideas as to what the key sustainability goals and action fields are and how they should be weighed. Various scientists (among others, see Cohen 2012; Jaekel 2015; Meier/Portmann 2016) have adopted and further developed the smart characteristics provided by Giffinger et al. (2007). This is the reason that the smart city has undergone several developmental steps based on different notions of the balance of power between technology and people over the last decades. This makes the smart city a fuzzy concept; it was satirised by Hollands in *Will the Real*

Smart City Please Stand Up? (2008) in the style of the television programme, *To Tell the Truth*. In what follows, the various developmental stages of the smart city (Figure 5) concept are illustrated and arguments are provided for how the smart city is defined in the context of this thesis.

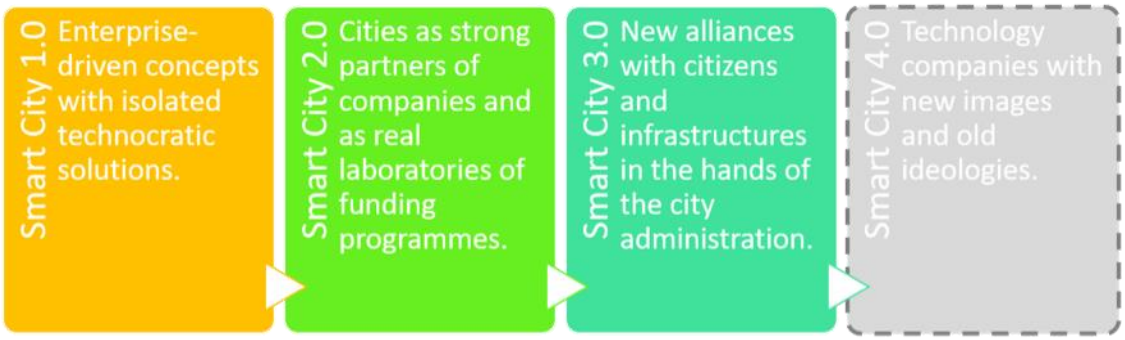

Figure 5 **The development stages of the Smart City concept, from Smart City 1.0 to Smart City 4.0. Own representation changed after Humann 2019.**

The first generation of the smart city (Figure 5) was driven by private sector technology companies such as Cisco (Cohen 2015). For years, images of the future smart city 1.0 presented a sterile city that seemed above all controllable. Cities repeatedly fall prey to the diffuse belief that such a technology-oriented solution can make them competitive and modern in one fell swoop, thereby stimulating economic growth. The most impressive examples of this generation are smart cities, which have been completely redesigned and partly realised on greenfield sites such as New Songdo City in South Korea, Masdar City in the United Arab Emirates, and Fujisawa Sustainable Smart Town in Japan (see Caprotti/Yu 2018). By collecting and evaluating as much information as possible, they can not only offer targeted advertising and services but also develop new cutting-edge technologies in the field of artificial intelligence (AI) and automation to secure market sovereignty in the long term – whether for self-propelled cars or automated logistics (Humann 2019). Smart cities 1.0 are characterised by the fact that the solutions to problems in urban areas were developed by technology companies. This included solutions to problems that had not previously been on the urban planning agenda. As a result, city authorities were not able to correctly understand the impact of the technological solutions, let alone their effect on the quality of life of urban residents in terms of monitoring, data collection, etc. Basically, the tech-driven smart city 1.0 misses the key dynamic of how cities interact with their citizens (Cohen 2015).

Some cities and mayors have questioned such technological solutions and have focused on the question of how the use of technology can improve quality of life. The result is a second generation of smart cities, smart city 2.0 (Figure 5) in which the city administration, as opposed to technology providers, performs a key role (Humann 2019). In the second development phase of the smart city, the city administration once again takes over the lead of the municipality. The lessons learned from smart city 1.0 have resulted in the use of technology to meet the needs expressed by the municipality. These mostly focus on technology solutions to improve quality of life and gain greater sovereignty (see Etezadzadeh 2015: 53–54). Most of the smart cities developed today are those of the second developmental stage (Cohen 2015).

The model of the smart city 3.0 was developed as a critique of the other smart city development stages and to follow a more citizen-led and less technological urban development path that pursues participation and social sustainability. In the context of this study, the third and current smart city development stage is regarded as the central model when smart cities are referred to. Concepts germane to smart city 3.0 are, for example, the Humane Smart City (see Almeida/Doneda/Costa 2018; Concilio/Rizzo 2016), the Open Smart City (see Habenstein/D'Onofrio/Portmann/Stürmer/Myrach 2016), and the Citizen-oriented Smart City (see Beinrott 2015). What these concepts have in common is that they describe the smart city as a space of urban co-creation in which planning is focused on citizens' wishes, interests, and needs and how technology and new actor cooperation models can benefit these (see Bauriedl/Strüver 2018; Bolívar/Muñoz 2019; Cohen 2015; Costa/Oliveira 2017; Elmqvist et al. 2018; Humann 2019; Metzger/Portmann/Finger/Habenstein/Riedle/Witschi 2018).

This shift in the focus of smart cities from technology to people is strengthened by the New Urban Agenda, which sets global standards for urban development over the next 20 years and was adopted as a result of the Habitat III conference on housing and sustainable urban development in Quito, Ecuador, in 2016. The visionary principles and commitments of the New Urban Agenda are particularly to create inclusive, participatory, and environmentally friendly cities (Woodbridge/Zimmermann 2016: 2). These goals are of central importance for the future in view of increasing global urbanisation, digitalisation, and networking. It is also important that local actors in the smart city manage to de-industrialise their thinking by collaborating and co-creating with citizens and new actors such as universities (see Morozov/Bria 2018).

According to many experts (see Barns 2018; Bosch et al. 2017; Hartemink 2016; Kogan 2014; Pereira et al. 2018), Governance in urban development, as a process and product of collaborative decision-making and action, has a leading role to play in building a smart city by combining synergies between most of the characteristics described (Figure 5). However, the role of smart governance within a smart city described by Giffinger et al. (2007: 11–12) is not 'smart' – it is merely business-as-usual. In order to support the demanded focus on the people, a new kind of governance is required to take care of citizens' interests and ensure the cooperation of various actors in politics, administration, business, civil society, and universities via new innovative organisational structures that are ideally supported by technology (see Schneidewind 2018; Carrillo 2015).

Currently, a fourth smart city developmental stage (Figure 5) is emerging; it again originates with big private tech companies, such as Google. Yet, again, it is a matter of thinking about urban design and new technologies combined with a focus on the latter to implement open digital infrastructures to collect citizen data. According to Humann (2019), the only difference between smart city 1.0 and 4.0 is the sales language, and, therefore, the fourth developmental stage of smart cities can be seen as a step backwards: 'The smart-city discussion makes it clear that if technology dominates, the idea of a social city is hanging by a thread. With a new awareness of the strong influence of digital transformation on cities, however, a strong counter-narrative with powerful images can emerge: a narrative that focuses on the human scale and public welfare interests' (own translation of Humann 2019).

In summary, the smart city is understood in the context of this thesis as a concept that attempts to address the challenges of current and future urban development through integrated social sustainability. Integrated means that the influence of the social sustainability dimension on the other two dimensions, ecological and economic sustainability, is taken into account (Figure 6).

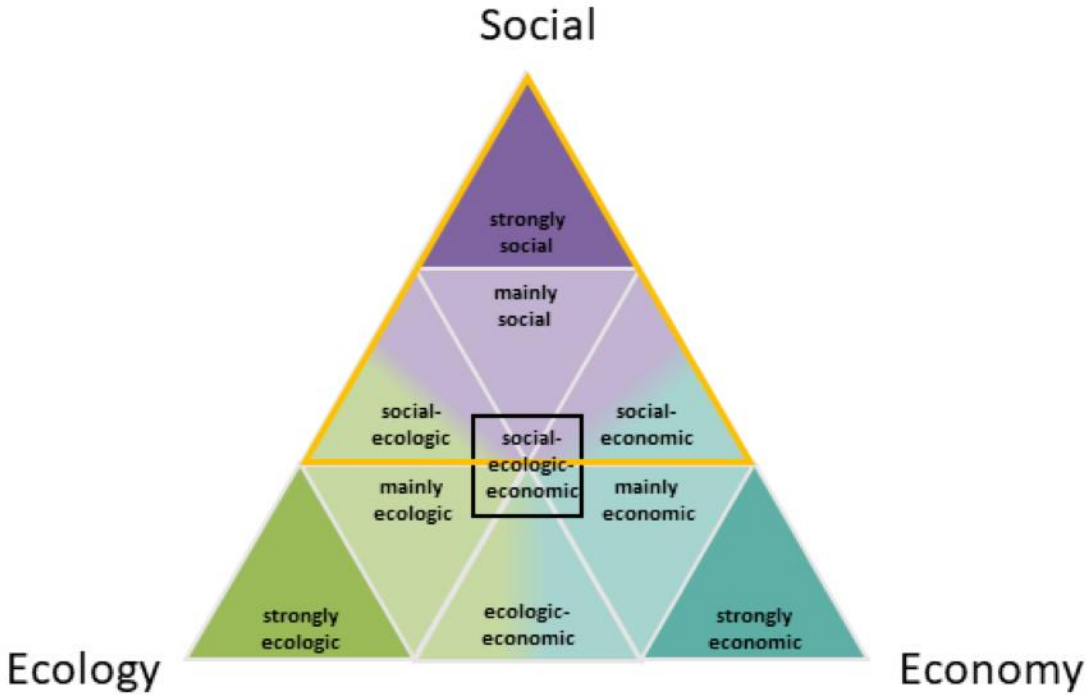

Figure 6 **Integrated Sustainability Triangle with a focus on integrated social sustainability effects (outlined in orange) (adapted from Hauff and Kleine 2009: 113).**

'Social sustainability occurs when the formal and informal processes; systems; structures; and relationships actively support the capacity of current and future generations to create healthy and liveable communities' (WACOSS n.d.). Social sustainability effects primary human issues such as social equity, community development, social capital, human rights, and community resilience. Social-ecological sustainability addresses human issues that also effect ecological sustainability, such as emissions, climate change, and biodiversity and, therefore, environmental awareness. Social-economic sustainability refers to human issues that also effect economic sustainability such as human capital, industry and co-creation, and innovation and spill-over effects (Hauff/Kleine 2009: 15ff).

Since smart governance has been identified as the supporting framework of the smart city approach, the logical consequence is that smart governance must serve the establishment of the integrated social sustainability dimension. Therefore, fields of action need to be defined which smart governance addresses through its implementation in urban space. The following five fields of action of smart governance are identified on the basis of literature research and the author's own considerations from a socio-geographic perspective: Social empowerment, social resilience, and social justice in terms of fostering a mainly socially sustainable development; social innovation in terms of fostering social-economic sustainability; and social learning in terms of fostering social-ecologic sustainability (Figure 7).

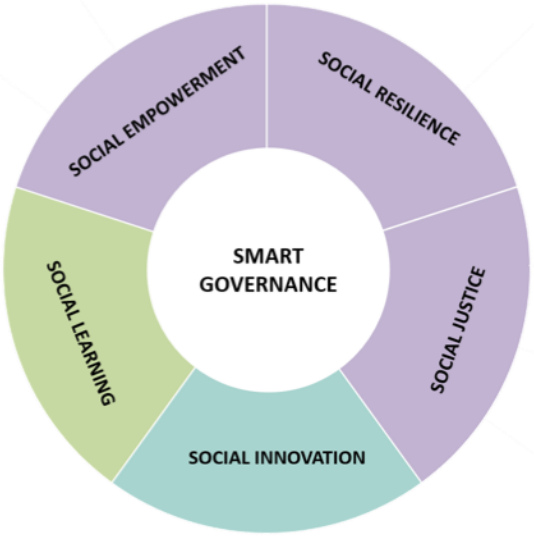

Figure 7 **Fields of action of smart governance. Fields in purple are mainly social, the field in green is social-ecological, and field in blue concerns social-economic sustainability (Own presentation and content. Design is inspired by Cohen 2012).**

These fields of action of smart governance need to be further described by means of indicators in order to make them projectable, controllable, and communicable, that is, operationalisable (Renn/León/Clar as cited in Hauff/Kleine 2005: 23). For this purpose, existing geographical governance theory is taken as a starting point and the extent to which it can address the integrated social sustainability dimension of the smart city is examined. In addition, the literature on smart governance is added to derive indicators for the fields of action.

2.2 Juxtaposition of Governance Theories

As the smart city represents an intelligent, future-oriented city, in other words, a normative concept, it is necessary also to embed smart governance in the normative context of geographical governance research. Since the smart city in general functions either on the scale of larger urban districts, with an integrated approach to the city, or as an independent urban structure in terms of greenfield development, the theory of the normative concept of 'good urban governance' is seen as the applicable metatheory from which to derive a definition of smart governance. In what follows, the theory on good urban governance is summarised and then compared to the theory on smart governance in order to define the author's own fields of action and indicators for smart governance – Smart Urban Governance.

It is important to note that collective urban governance is not novel. It can be traced back to ancient Greece where democratic mechanisms were well developed, and citizens could influence political institutions (Dool/Gianoli/Hendriks/Schaap 2015: 12). The idea was ignored and degraded in the course of industrial urbanisation and modern planning. As modernism transformed the political aspects of planning, ignoring its social and democratic character as this had historically developed in European cities, it became obvious that, in urban renewal processes, issues of public participation, civic engagement, inclusiveness, and transparency should regain attention and

priority. These practices were conceptualised as urban governance as a kind of counter-model to government (city administrations, etc.), the classical relationship of hierarchical control between state and society (Badach/Dymnicka 2017: 5; Einig/Grabher/Ibert/Strubelt 2005: 1). While government refers to the autonomous activity of a government, governance refers to network-like structures of interaction between state and private actors (Benz 2004: 18).

According to Einig et al. (2005: 2–3), Urban Governance is characterised by several features. On the one hand, a heterarchy is pursued, which means that the state withdraws from the direct regulation of urban problems and in return offers incentives for private actors to find solutions to these. In implementation, this usually takes place through participation procedures and the decision-making participation of weaker actors so that a collaboration between the private (companies as well as civil society) and the public arises (ibid.). On the other hand, as a rule, these cooperative implementations do not replace urban control authorities but are implemented parallel with them. Therefore, urban governance does not only include actors of the political-administrative system though it necessarily integrates the private sphere. This means that both private-sector actors and civil society actors are included. urban governance thus moves within this intermediate space. In this context, formal institutions are increasingly being joined by informal ones in handshake agreements, informal agreements, round table negotiations, and personal relationships of trust (ibid.). Additionally, urban governance is often limited in time in its implementation, for example, in the shape of organisations for the realisation of explicit projects, such as long-term visions or short-term projects. These organisations often manifest themselves as intermediary actors (ibid.).

Overall, urban governance can be summarised as the joint and institutionally fixed regulation of urban development processes, from project to city-wide level, by a variety of actors, such as decision-makers who are part of unofficial and official, flexible and abiding collaboration networks with flat as well as vertical structures and explicit power balances (Hohn/Neuer 2006: 293).

Good urban governance strives to change relations between local governments, organisations, residents, urban movements, and many others with regard to essential quality standards (Hendriks 2014: 564). These quality standards have already been established by various researchers and organisations and generally pursue a social sustainability approach. Therefore, these quality standards can likely serve as indicators for the fields of actions. In what follows, selected literature on good urban governance and smart governance along with the fields of action is compared with the purpose to identify their similarities and differences and to derive Smart Urban Governance indicators. On the one hand, this emphasises the normative character and the derivation or extension of the geographical term good urban governance. On the other hand, this term has not yet appeared in the scientific discourse and is therefore a *tabula rasa*.

Figure 8 Overview of the 17 Sustainable Development Goals to transform the world (UN 2015).

As mentioned above, the international framework of the New Urban Agenda influenced the smart city concept, especially the third development stage, which is the focus of this study. The New Urban Agenda is based on the SDGs and its indicators, mainly SDGs 3,4, 5, 8, 9, 11, and 16 (Figure 8) these, recent findings from research and practice as well as their proposals for a definition of smart governance and for indicator generation have been taken into account in order to derive the indicators for the defined fields of action of Smart Urban Governance.

2.2.1 Social empowerment

According to Hendriks (2014: 566), urban governance may be beneficial if it has organised representation, participation, accessibility, and openness. To this end, considering Healy/Cote (2001: 21), the development of social capital is indispensable (Kogan 2014: 63; Pereira et al. 2018: 18). The participation process is understood as a bilateral exchange of information, involving local communities in the planning phase and multi-stage consultation process (Badach/Dymnicka 2017: 4–5). A direct participation structure for civil society in urban planning and administration that functions regularly and democratically is also demanded by the SDGs (UN 2019).

Civil society is also important as an actor for the successful implementation of a holistic smart governance approach (Albuquerque 2019: 1295; Habenstein et al. 2016: 53). The integration and acceptance of the urban community as a user of the city are essential. This can be accomplished, for example, by creating formal or informal opportunities for participation (Jaekel 2015: 25). To this end, ICT could be used to improve decision-making between different actors by enabling E-Participation for citizens (Pereira et al. 2018: 1).

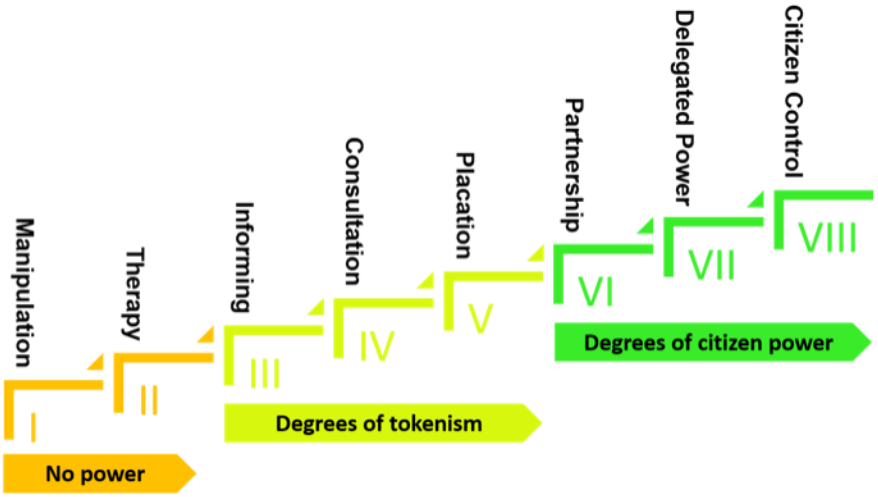

Figure 9 **Ladder of citizen participation. Own representation based on Arnstein 1969: 217.**

At a formal level, to pursue a socially-focused smart city, citizen sourcing, which is top-down and based on a partnership between citizens and administration (and which corresponds to level V on the Arnstein ladder, Figure 9) could be established. The consideration is that residents should be directly involved in public decision-making. The active involvement and direct participation of citizens in the development process are essential to create the necessary awareness and long-term support for smart city projects (Bosch et al. 2017: 176).

At an informal level, the DIY urbanism could be seen. This involves bottom-up actions, in the form of innovative, ambitious, and cost-effective solutions to difficult or unresolved urban problems, implemented by citizens. Lefebvre (1996) captures such tensions in the term 'the right to the city' (Finn 2014: 381; Zhilin/Klievink/Jong 2019: 89). This level of participation corresponds to level VIII, citizen control on the Arnstein ladder and usually occurs only during or after project implementation (Figure 9).

The government should strengthen the position of citizens and give them the opportunity to participate in shaping and administering public places (Zhilin et al. 2019: 88). An open and transparent city administration based on open data and communication networks (open government data) can serve as a basis for the successful implementation of civil participation approaches (Habenstein et al. 2016: 54–55; Jaekel 2015: 27; Meier/Zimmermann 2016: 5; Pereira et al. 2018: 1; Walser/Haller 2016: 19). These data include documents on urban planning, operations, budget, strategy, and statistics which are usually available on the websites of the respective authorities (Bosch et al. 2017: 292).

Furthermore, the UN (2019), Meier/Zimmermann (2016), and Jaekel (2015) declare that smart governance should promote the provision of a high-quality living environment. This includes green and blue infrastructure (various small or even large green or water areas such as parks, gardens, lakes, etc., which can provide benefits for man and nature), a multifunctional public space with leisure facilities and meeting places, a cultural environment, and easily accessible public facilities. The meeting places are important because they can also serve as productive social capital to be occupied by

citizens (the right to the city). Social capital can be exchanged and transferred materially or symbolically within the network so that all members can take advantage of network membership and form a community (Bourdieu 1983: 183–198). The generation of social capital is particularly important in completely new urban structures, both as regards community-building and the level of participation sought.

In summary, the following indicators can be identified: open government (data), civil (e-)participation between citizen sourcing and DIY urbanism as well as the promotion and generation of social capital by the corresponding urban infrastructure for the Smart Urban Governance field of action of social empowerment.

2.2.2 Social resilience

With the aim to be socially resilient to the current and future challenges of urban development in the form of population decline due to ageing and low fertility, it is important to make smart cities attractive to people from around the world. This point does not currently feature in the good urban governance debate; rather, it occurs in smart governance discourse. An internationalised population, for example, in the form of foreign students, employees, urban consultants, and the like can also open new perspectives on the city, break conformity, and enrich civil participation (see BBSR/BMUB 2017: 29). According to Paterno (2011: 79), however, this is only one of many solutions.

Another key that comes from the good urban governance debate (see Badach/Dymnicka 2017: 5; Hendriks 2014: 565), which is also addressed in smart governance discourse (see Bosch et al. 2017: 81; Neto/Silva/Nakano/Pérez-Alcázar/Kofuji 2019: 1356ff.; UN 2019;) and is related to immigration, is inclusivity (SDG 11). Cultural diversity and social cohesion are central components of these Governance approaches, which call for the greater involvement of women, minorities, and the disadvantaged with the purpose to achieve a diverse and open community. This is directly linked to the issue of gender equality (SDG 5), which aims to strengthen the position of all women and girls in society, for example, by means of well-paid jobs and important management positions (see Bauriedl/Strüver 2018; UN 2019).

In spatial terms, diversity and inclusivity should be reinforced by a broad range of housing options (different sizes and price levels) for families, single people, the low-income population, and the physically handicapped (see Bosch et al. 2017: 82). In the case of spatially concentrated interventions such as the smart city, inclusion also involves the positive side effects of urban development on surrounding neighbourhoods and their inhabitants.

In summary, the indicators of immigration, inclusion, and gender equality are decisive for the Smart Urban Governance field of action of social resilience.

2.2.3 Social justice

According to Sinning (2006: 88-89), good urban governance needs to create a local culture of recognition and interfaces between citizenship, administration, and politics close to the rule of law. Good urban Governance focuses on the reconciliation of interests, that is, on the institutionalisation of counterforces and responsibilities of actors, offices, and organs that keep one another in check. In practice, this usually

does not work without the intervention of an entity mediating between the various actors from individual interest groups (see Hendriks 2014: 16; Romero-Lankao 2012; UN-Habitat 2011). Furthermore, collaboration between the actors needs to occur transparently and in open partnership, that is, with all the local actors represented (Löffler 2001: 212).

These assumptions and recommendations concerning representative and mediated actor collaboration which is transparent and law-abiding can also be found in smart governance discourse (see Bosch et al. 2017: 161; Burch 2018: 320f.; Pereira et al. 2018: 1), following SDG 16 (UN 2019).

According to Schneidewind (2018: 277f), use of the digital tools of ICT can play a vital role making such new collaboration models possible. Smart governance should foster the commitment of civil society, for which has already been argued in Chapter 2.2.1, and of scientific institutions following the 'third mission' or municipal and public-interest enterprises such as non-governmental organisations (NGOs) and non-profit organisations (NPOs). This is explained in greater detail in the following chapter.

In summary, the indicators of transparency, collaborative decision-making under intermediate leadership, and law-abidingness can be identified for the Smart Urban Governance field of action of social resilience. The three fields of action, namely social empowerment, social justice, and social resilience are further features of the mainly social sustainability dimension.

2.2.4 Social innovation

Good urban governance is considered to be responsive, that is, it demonstrates an ability to actually do things and solve problems (Hendriks 2014: 567). Therefore, it needs to be adventurous and flexible. This goes hand in hand with fostering innovation and a general openness to change. It builds on a culture of cooperative action such as co-production and co-creation to promote innovation, which is usually pursued via public-private partnerships (ibid.).

Smart governance discourse has produced several new interventions on the topic of innovation: 'promot[ing] sustained, inclusive and sustainable economic growth [to generate] full and productive employment and decent work for all' (SDG 8 and SDG 9, see UN 2019). Co-production and co-creation combined can be condensed in the term co-innovation, an innovation process with private participation from both the professional and civil side. Co-innovation is to be used as a tool to facilitate the interaction of digital, economic, scientific, and social structures (see Jaekel 2015: 27; Meier/Zimmermann 2016: 5). Therefore, soft infrastructure (knowledge-based and knowledge-enhancing services), highly qualified workers, students, and knowledge-based companies are to be coupled in, for example, the form of PPPPs (Dewalska-Opitek 2014: 332). In addition to locations that are initiated from the top down where new applications and business models are developed through digital innovation (by fostering entrepreneurship), there would also be non-commercial and self-organised spaces, such as FabLabs and HackerSpaces. Both of these spaces are created by the city administration; those created by the residents themselves could function as places of origin for bottom-up initiatives, as residents here would produce

data, information, and knowledge with local relevance with or without commercial exploitation (Becker 2018: 250).

As mentioned above, universities following the 'third mission' produce knowledge-based urban development by offering new and innovative participation opportunities for civil society (Fig. 10) and are therefore new actors in collaborations that occur with a smart governance approach. In addition to citizen science, which is explained in Chapter 2.2.5 in connection with knowledge co-creation, the urban living lab approach is the focus here. Urban Living Labs are subspaces of the city in which it is examined how (technological, planning, and social) innovations meet socio-spatial reality by allowing participants to test innovations in real urban life (Schliwa/McCormick 2016: 174). In smart cities, the application of urban living labs is often extended to the entire project area. Here, one often finds that urban living labs seek possible applications for digital technologies rather than combining the innovations tested there with social reforms (Bauriedl 2018: 76f.). This latter combination would entail a responsible urban living lab approach that offers added value for the residents instead of simply using them as test persons.

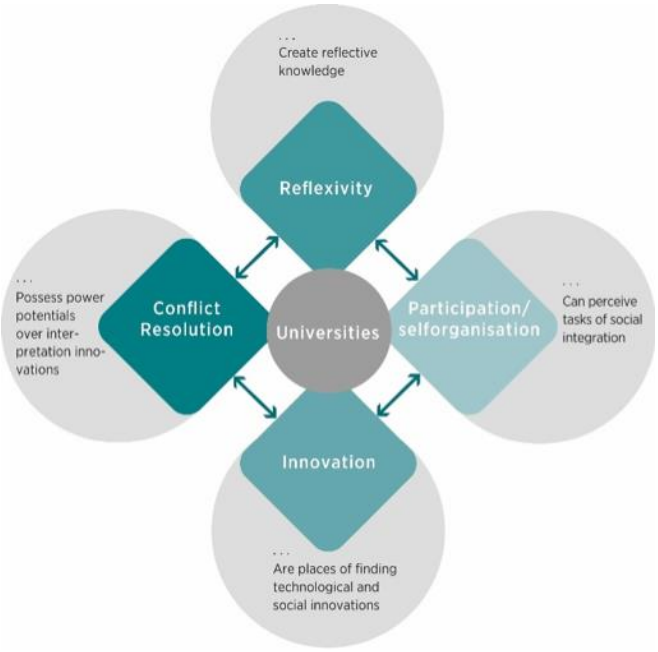

Figure 10 Potential functions of universities in future urban development (Source: Schneidewind 2018: 443).

In addition to new local actors in the collaboration network, international cooperation should also be promoted. This will become even more commonplace as a result of ICT. Although no literature has been found in this context that would postulate the relevance of international actor cooperation in the context of good urban or smart governance, however, influencing and overcoming planning conformity through international influences, mostly in the form of travelling concepts, has always been relevant for urban development and governance processes. The reason is, that travelling concepts foster. The reason is that travelling concepts promote interdisciplinarity and interculturality and thus cross-border dynamics (cf. Neumann/Nünning 2012).

In conclusion, the indicators of the involvement of external and extraordinary experts to derive and apply travelling concepts for overcoming local planning conformities as well as co-innovation and a responsible urban living lab approach are central to the Smart Urban Governance field of social innovation. Together these represent a component of the social-economic sustainability dimension.

2.2.5 Social learning

The generation of intellectual capital, that is, individual but nevertheless general knowledge, is another important characteristic that distinguishes good urban governance (Healy/Cote 2001: 21). Therefore, equitable, quality education needs to be ensured and lifelong learning has to be promoted (SDG 4, see UN 2019).

Within smart governance discourse, this factor is strongly emphasised in connection with the 'third mission' of universities; however, it also applies to NGOs and NPOs that promote knowledge transfer between them and civil society (Dewalska-Opitek 2014: 331f.; Goddard/Vallance 2013: 35f, 48f.; Jaekel 2015: 60f; William/Webster/Leleux 2018: 100). This intervention is described as knowledge co-creation, a mechanism for developing solution-focused interfaces between academics and non-academics. According to Buyana (2018: 436), knowledge co-creation promotes the opportunity for civil society to contribute to the framing of research questions and to design methodologies for finding and experimenting with options for urban sustainability. Forms of implementation of knowledge co-creation such as citizen science, for example, are topic-specific, though in this context can also contribute to the environmental awareness of the residents (Bosch et al. 2017: 75).

From the author's perspective, generating environmental awareness goes hand in hand with an Internet of Things (IoT) that benefits civil society instead of monitoring residents by means of sensory systems and mobile devices. The measurement and publication of individual and city-wide emission and electricity consumption data can contribute to the formation of environmental awareness. For data protection reasons, individual data can be transferred, for example, to a private mobile phone and general consumption data can be displayed on public electronic signage. Another beneficial IoT approach can be seen in its application in healthcare. For example, to increase efficiency in health practices and thus save costs or to deliver healthcare services via mobile devices, such as health tips and education, health facility information, and the like. (Ejaz/Anpalagan 2019: 11). In addition, the provision of public WIFI (Wireless Fidelity) enables residents to access the data and services provided by the city administration. This public data can then be used for open data projects and ultimately improve the ecological, economic, and social performance of the city (ibid.: 10).

Basically, the indicators of knowledge co-creation and the benefitable IoT for implementing environmental awareness are decisive for Smart Urban Governance. Together these form another component of the social-ecologic sustainability dimension.

2.3 Catalogue of Indicators

As outlined above, there are numerous overlaps between good urban governance and smart governance discourses. Smart governance can be seen as an add-on to good urban governance, which additionally attempts to make these quality standards more

efficient and systematic by means of digitalisation (ICT, AI, and IoT) and further adds new, analogous quality standards to overcome current urban development challenges (Badach/Dymnicka 2017: 6). According to Meijer/Bolivar (2015: 392-408), smart governance aims for a socio-technical perspective in which ICTs serve as a tool to facilitate collaboration between actors. The implication of digitalisation is relevant but not essential.

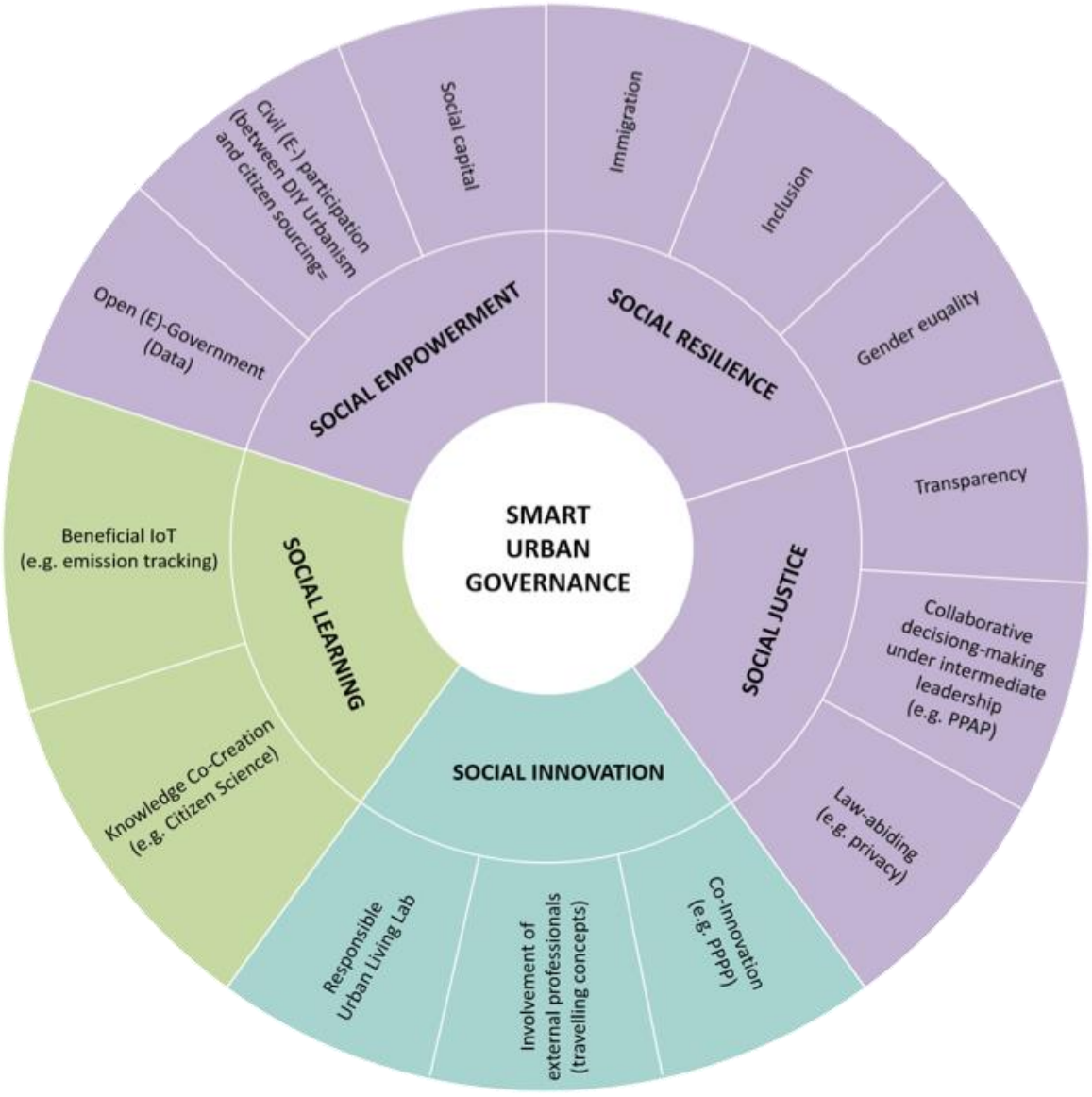

Figure 11 **Fields of action and the respective indicators of Smart Governance. Fields in purple are mainly social, fields in green are social-ecological, and fields in blue represent social-economic sustainability (Own presentation and content. Design is inspired by Cohen 2012).**

In this case, Smart Urban Governance is not merely a strictly technological issue but becomes a matter of developing infrastructure for enhancing knowledge and improving the understanding of the interactions between society and government following an integrated social sustainability approach based on a socio-geographic perspective. In this context, particular attention is paid to the spatial effectiveness of the indica-

tors. Digitalisation is therefore used to co-ordinate rather than prescribe and pre-organise. Taking into account the scientific discourse on smart cities, the related good urban governance and smart governance definitions and their first attempts at creating indicators, with the addition of the author's own ideas based on a socio-geographical perspective, the catalogue of indicators presented in Figure 11 were derived and compiled. This is examined in greater detail in Table 3 (Annex, p. 108).

3 Methodical Approach

Methodically, the thesis employs a qualitative approach. As mentioned above, there is currently no scientific consensus on what smart governance should be, which is why it has been necessary to define this term; the outcome is Smart Urban Governance. In order to make Smart Urban Governance operationalisable and therefore applicable and verifiable to case studies, a separate indicator catalogue was developed. The aim is to answer the call in current scientific discourse for images and tools for the orientation of further future urban developments. To create a study design, the theoretical basis of good urban governance and smart governance as well as their indicators within the framework of future urban development, monographs, scientific papers, published dissertations and theses as well as existing sustainability indicators, such as the SDGs, were evaluated. Based on an analysis of the English-language primary and secondary literature on Kashiwa-no-ha as well as an examination of the literature on the two thematic pillars of the smart city and smart governance, guided expert interviews were conducted on site.

1.1 Qualitative Empirical Survey

There are many primary studies in English and Japanese that were available for the case study. These are made available by on-site planning and developing actors via their websites and in the form of hand-outs. These achievement reports, master plans, information brochures, and presentation slides utilised for the analysis. Documents received from teachers and students of the University of Tsukuba were also evaluated. The few pieces of secondary literature, of which there is little available in English and much in Japanese, rarely deals with a case study from a geographical perspective and even more rarely with geographic governance research.

1.1.1 Data collection tool

For the abovementioned reasons, the collection of additional primary data via the author's own empirical surveys based on qualitative guideline-based expert interviews, following Kaiser (2014), was essential to close the data gaps that arose in the course of the literature research. The expert knowledge that was collected, in the form of operational knowledge, context knowledge, and interpretative knowledge (Kaiser 2014: 44), is intended to verify and expand the findings of the analysis of the secondary data.

The interview guide's key questions were based on the model developed by Hohn (Hohn/Reimer 2014: 325) for the analysis of the 'two institutional worlds of governance' (Figure 12). The model is described in detail in Chapter 3.2. Every interview guideline's questions were tailored according to the role of each interviewed expert. However, the main topics under which the respective questions were summarized were the same for all experts interviewed (the self-perception of an actor within the project and his or her collaboration network, the formal or informal institutions the actor uses or is bound to, the progress and process of the project, the participation structure, and spill over effects). The first interview guidelines had weaknesses in content and structure which only became apparent when the interviews were conducted. Therefore, the interview guidelines were continuously streamlined during the survey phase and can be found in Annex 3.

1.1.2 Sample selection and empirical implementation

The selection of interviewees was based on two criteria. First, that the interviewee is or was involved as an actor in the project. Second, that the actor had knowledge in the form of operational knowledge, context knowledge, and interpretative knowledge (Kaiser 2014: 44). At least one expert interview was conducted with a representative of each stakeholder group (public, private, academic, and civil) of the actors involved in the case study area. From 02/15/2019 to 04/15/2019, 12 qualitative interviews were conducted on site with expert actors of Kashiwa-no-ha (Annex, p. 105ff.). For later evaluation, the interviews were recorded with the consent of the interviewees using a digital voice recorder. Furthermore, four independent and three guided field trips as well as one event visit were carried out (Annex, p. 105ff.). The field trips were recorded either in the form of protocols (Lüders 2008: 396ff.) or photographically (Harper 2008: 402ff.) (Annex, p. 105ff.).

1.1.3 Data evaluation tool

Qualitative content analysis based on Kaiser (2014: 99-105) was used for evaluation of the interview data. All the interviews, recorded as sound files, were transcribed word by word using the f4 software. The interview statements were then paraphrased to limit the answers to the communicated content or information. The mode of communication was not considered and not evaluated. The accuracy of the content of the interview transcripts was later checked and confirmed by the respective experts. Thereafter, the paraphrased interview transcripts have been coded by category using the professional data analysis program, MAXQDA. In accordance with the principle of openness of qualitative content analysis, the coding categories were developed directly from the data collected (Kaiser, 2014: 99f.). All encoded interview transcripts are attached to this thesis (see Annex 4). In a later step, these coding categories were assigned to the governance analysis categories (societal embedding/path dependencies, space effects, endogenous/exogenous drivers, process, informal/formal institutions, and actor collaboration) according to Hohn (Hohn/Reimer 2014: 325) in order to operationalise them for later indicator evaluation. This analysis scheme is described what follows.

1.2 Governance Analysis

Governance can be considered both a descriptive and a normative concept as it refers to the way in which organisations and institutions are (or should be) governed. This differentiation is directly related to the distinction between descriptive approaches focusing on governance and normative ones focusing on good governance (Dool et al. 2015: 13).

1.2.1 Descriptive approach

For the scientific descriptive analysis of governance in the urban geographical context, Hohn et al. (2006) have interwoven the institution-oriented approach of Digaetano/Strom (2003) and the actor-centred approach of Mayntz (2004) into an 'actor-centred institutionalism' and applied it to the urban level. Accordingly, the aim of governance research in to analyse networks of actors, formats of control, regulation and coordination, procedures and tools, as well as their institutional integration and

path dependency or change as a result of the actions of the actors with intention to lend to a clearer comprehension of urban development processes and the spatial effectiveness of governance (Hohn et al. 2006: 9). While maintaining the focus on formal and informal institutions in relation to the regulation and negotiation processes between local actors, this analysis scheme can generate profitable insights into the predominant governance processes from an urban geographical perspective, independent of the level of scale and other specific characteristics of the research area (ibid.).

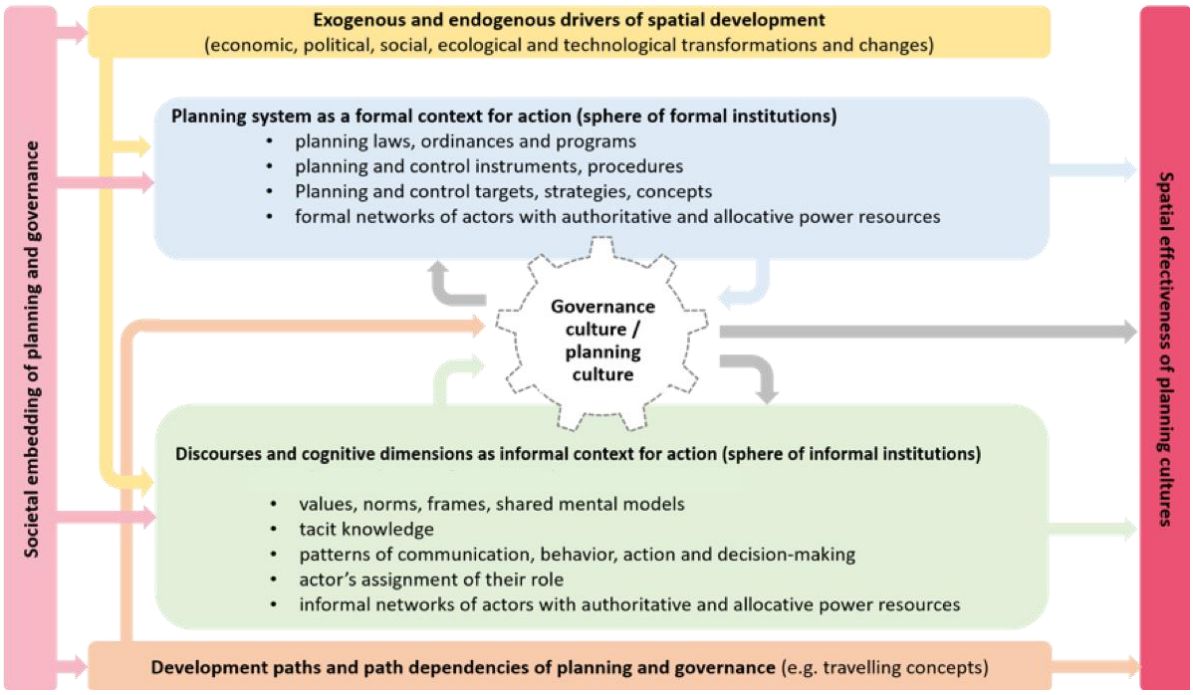

Figure 12 Governance analysis scheme for urban development processes (Own representation and translation of Hohn (Hohn/Reimer 2014: 325).

Hohn's (Hohn/Reimer 2014: 235) governance analysis scheme (Figure 12) employing 'actor-centred institutionalism' was used for the purpose of extracting governance-relevant data on Kashiwa-no-ha from the primary and secondary literature and from the interviews (Chapter 4).

3.1.1 Normative approach

In order to assess the smartness of the case study's implemented governance, a qualitative set of indicators based on an integrated social sustainability approach has been developed and applied to Kashiwa-no-ha. The indicators of Hauff/Kleine (2009: 166ff.) were determined on the basis of previously identified fields of action. In this way, thematic and formal relevance, compatibility of the indicators and their qualification were ensured. To assure their thematic and formal relevance, only those indicators were selected that are significant for the actors' field and can be influenced by them. In terms of qualification, only indicators for which sufficient data had been collected and which ideally cover different time periods, have been taken into account. Comparability of the indicators was ensured by enabling comparison with higher and lower political-geographical levels (vertical) and with other documents

and processes at the same level (horizontal). The outcome is a qualitative indicator set that operationalises Smart Urban Governance.

3.2 Challenges

The first challenge encountered was that the literature evaluation within the framework of creating a theoretical basis for this study was very ambitious. Since smart governance is a fuzzy concept, with many opinions and few definitions, reviewing the literature from a self-defined perspective turned out to be very ambitious and therefore challenging. Based on a socio-geographical understanding of governance, smart governance was ultimately derived from urban or good urban governance. Smart Urban Governance came to be seen as a more appropriate term for the object of investigation. This term is consistently used in this thesis but could not be taken into account in its title due to examination regulations.

This work examines planning contexts in Japan. To this end, empirical surveys were undertaken in there. As a result, the choice of the study design and the methodical implementation posed several challenges. The literature research on the case study was already limited by language barriers. Even though a large part of the primary literature is available in English, the original Japanese versions are often more detailed and were therefore also taken into account wherever possible. Due to language barriers, translation tools such as Google Translate had to be used to roughly decode the content. If the evaluation of specific passages from this literature was an option for the present work, the findings were always checked with a native speaker. The same applies to the Japanese secondary literature used. In addition, the survey period was chosen unfavourably, as it included the semester break, the end of the financial year, and other national particularities, which made the acquisition of interviewees more difficult.

Few of the actors at Kashiwa-no-ha were willing or able to conduct an interview in English. Therefore, more than half of the interviews had to be conducted in Japanese with the help of a Japanese-English translator. The quality of the interviews is therefore strongly dependent on the quality of the translator. Even though both the original Japanese of the expert and the English translation were recorded, only the English interview passages were transcribed. In order to prevent misinformation and data gaps due to language barriers as well as to preserve the quality criteria of qualitative research (see Steinke 2008: 319), the transcribed interviews were subjected to quality control. This involved the transcripts being checked again by both the translator and the expert interviewed. Nevertheless, with regard to the quality criteria of qualitative research, slight distortions due to the language barrier must be assumed.

In addition to the language barrier, there were also cultural barriers. The main research purpose of this study is to evaluate the extent to which Kashiwa-no-ha can be considered a model for future urban development (based on the definition of Smart Urban Governance provided). For this reason, more detailed questions, some of which were critical, on cooperation between the actors were posed in the interviews. As a result of being an isolated culture for such a long time, social behaviour may differ quite strongly from Western customs, especially towards Gaikokujin (foreigners; in short and less politely, Gaijin). Japanese react even more sensitively to criticism than do people from Western countries. Despite issuing criticism, the critic wants to

save face nonetheless. Criticism is therefore more likely to be expressed indirectly or not at all. There is also a widespread distinction between a publicly accepted (Tatemae) and a private-truthful opinion (Honne) (see Hijiya-Kirschnereit 1988: 13–16). Therefore, the authenticity of the answers to critical questions was usually dependent on the actor group to which the interviewed expert belonged (i.e. citizens were more honest than city officials in this context).

Since in Japanese urban planning culture different rules, laws, norms, and conformities are sometimes considered compared with, for example, Germany, this must be taken into account when evaluating the results. Where necessary, Japanese planning terms are explained in the analysis and findings are placed in the Japanese planning context to relativise their evaluation within the framework of the indicator analysis.

Overall, it should also be emphasised that, due to the lack of secondary literature, the descriptive and normative governance analysis of this thesis is largely based on the information collected through the 12 expert interviews. According to the quality criteria of qualitative research, this number is not sufficient to achieve significant results. Furthermore, the elaborated qualitative indicators are based on normative theory, which is usually very subjective and therefore limited in its comparability. The set of indicators reflects selected indicators and not all indicators in the discourse on governance in smart cities (such as privacy, human capital and tech companies as new actors with decision-making power and planning sovereignty. The selection of indicators can be explained in terms of the focus of the study design, difficulties in assigning them to the fields of action, and the limited scope of this thesis. The Smart Urban Governance indicators described could also be formulated more precisely for the purpose of distinguishing them more clearly from one another. The indicator for participation in particular is very vague. Furthermore, there is a lack of other indicators for the socio-ecologically sustainable fields of action. Similarly, some of the indicators are difficult to qualify, which makes their application to case studies more difficult. Nevertheless, it was possible to verify knowledge from the primary literature or to shed light on it from another perspective. Accordingly, the present thesis comes to some interesting and, above all, novel assessments of the case study that go beyond the existing literature.

4 Case Study – Kashiwa-no-ha Smart City in Japan

The following case study on Kashiwa-no-ha concerns the urban planning context of that country. This brings together national, cultural, and bureaucratic particularities that risk of being misinterpreted from an outside perspective. Precautions have been taken to avoid this and to obtain a correct, scientific perspective of the object of investigation. Thus, national, cultural, and bureaucratic particularities, that is, Japanese planning particularities and Japanese planning terms are contextualized where necessary and reference is made to the literature. The influence of this situation on the results of the case study is explained where the results are discussed.

1.3 Descriptive Governance Analysis

Kashiwa-no-ha is a large-scale greenfield flagship project with defined start and end date. Therefore, the governance analysis below follows the development process of the smart city. The driving forces in the initial phase, and the planning, organisation, negotiation, implementation, and stabilisation phases are examined with a view to the future. Since Kashiwa-no-ha is in a permanent upheaval, which has numerous both endogenous and exogenous drivers, it is essential to use the process as a basis for analysis in order to be able to understand the development of the actors themselves, that of the actor network, as well as the resulting effective spatial cooperation.

Due to the particularity that Kashiwa-no-ha is a smart city planned from scratch – from the beginning it was conceptualised and implemented in terms of a urban living lab approach under the direction of an innovative collaborative actor network, a PPAP – all of today's existing urban substance is somehow a product of governance processes and therefore a central object of the analysis (see Kurata et al. 2013: 240). Nevertheless, some examples of the spatial effectiveness of governance should be emphasised in which, above all, the defined Smart Urban Governance approach can be particularly vividly observed.

1.3.1 The pre-phase and initial phase for constructing infrastructure

Pre-phase

The pre-phase of Kashiwa-no-ha was characterised by several key driving forces as well as institutional changes, that drove the development of the area (Figure 13).

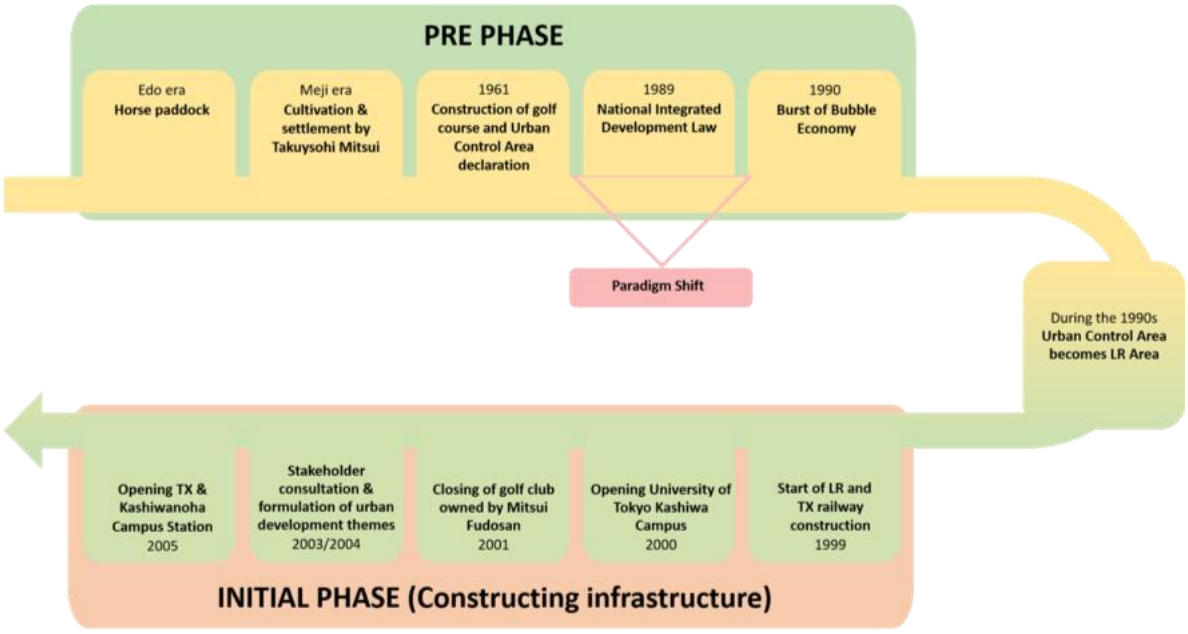

Figure 13 The pre-phase and initial phase of Kashiwa-no-ha Smart City (Own representation).

Today's smart city area (276 ha) is located in the north-western area of Kashiwa city in Chiba prefecture. In the *Edo* era (*Edo jidai*, started 1601), the location was occupied by a stock farm for the government's horses. During the *Meiji* era (*Meji jidai*, started 1868) a new government was born, and the stock farm was transformed into reclaimed land. In the cultivations, the Mitsui family directed some projects and they began to have an important role in this area. At the beginning of *Shōwa* era (*Shōwa jidai,* started 1926), Japan's national army established an airfield there. The American army also built their telecommunication base after Second World War.

Due to an economic boom emerging from 1961 on, Mitsui Real Estate Company had enough money to build a huge golf course on the land they already owned within today's smart city project area. In 1979, the American army returned their base, which was located outside the current project area. Afterwards, the Kashiwa Campus of Chiba and Tokyo University was created next to the land of former US military base (Interview 01, Annex 4) as, already in 1959, it had been decided to relocate 'inefficient users of land', including universities, to the outskirts of Tokyo with the aim to relieve the central campuses (Waley 2000: 129).

Initial phase

After the collapse of Japanese bubble economy, land prices fell significantly and many big national companies such as Mitsui Fudosan Co., Ltd. (afterwards described as MF) suffered financially. In the late 1980s, the Metropolitan Intercity Railway Company officially announced the plan to construct the Tsukuba Express (TX) railway (Interview 02, Annex 4) to connect Tsukuba City with the Tokyo's Akihabara district. At that time, MF owned less than 20% of the land in the project area, in particular, the golf course. The rest of the land was split between 900 landowners who had farms in the area but lived in neighbouring Kashiwa Tanaka. To secure the area from urban sprawl problems caused by the poor planning driven by exponential population growth and the temporary financial possibilities of the bubble economy, this

part of Kashiwa City was proclaimed an Urban Control Area (UCA, *shigaika chōsei kuiki*) (Interview 02, Annex 4). The main cause of urban sprawl in peripheral, mostly agricultural areas is ad hoc and poorly planned infrastructures such as roads. Such interventions in agricultural areas can also lead to random urbanisation. According to Tariquzzaman (2009: 98) and Ishida (2007: 117), the land use regulation in the form of the UCA originates in the 1968 New Urban Planning Law (*Shin toshi keikaku hō*) and serves to protect declared areas and contain of urban sprawl by prohibiting public investments. The New Urban Planning Law was the first full-scale revision of the very first Japanese Urban Building Law of 1919 (*Shigaichi kenchikubutsu hō*) (Sorensen 2005: 213–214). The converse of an UCA is an Urban Promotion Area (UPA, *shigaika kuiki*).

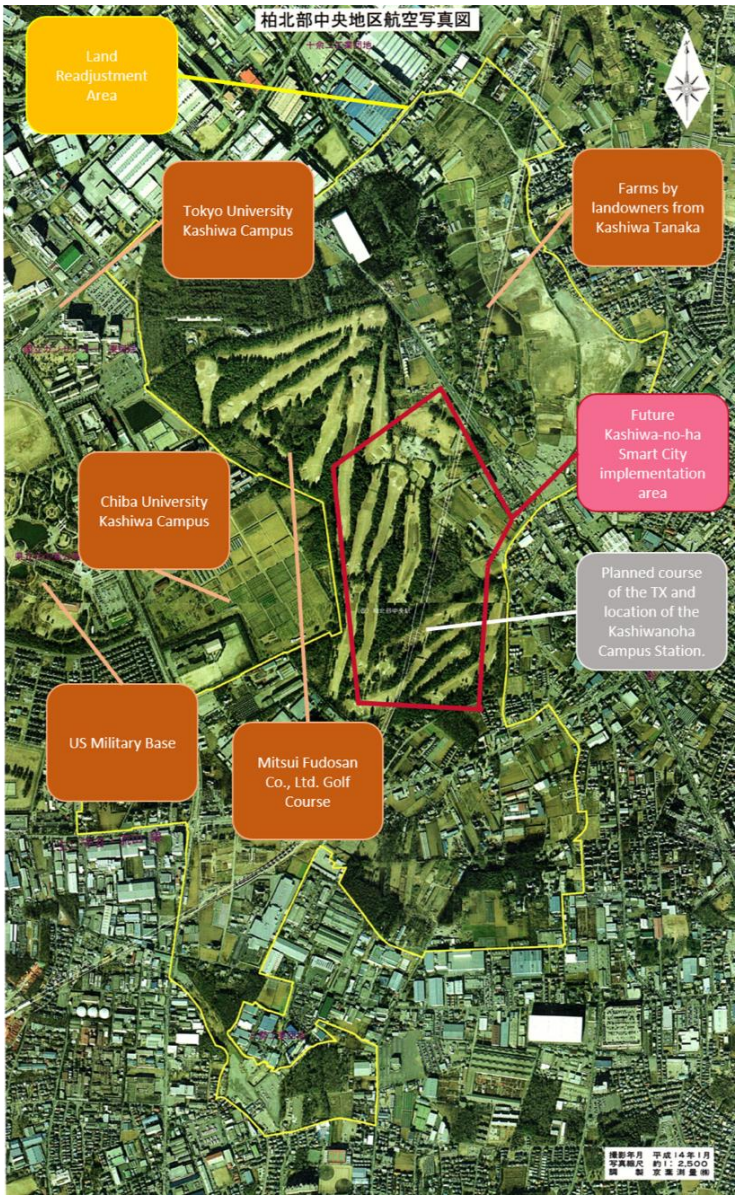

Figure 14 **Pre phase: Marked LR area and future course of TX. The former Mitsui Golf Course is located on the site of today's Smart City. The existing infrastructure that was later used is located outside the LR area on the western side: Tokyo Kashiwa Campus. (Source: Own representation changed after Chiba Prefecture 2019).**

Land Readjustment (LR) was necessary to implement urban development on a large scale. The service of the Chiba Prefecture's LR Office was essential to defining this new spatial area (Figure 14). In 1989, the National Integrated Development Law was promulgated, which pursues to foster both railway construction and urban development along the railway in an integrated approach. The Integrated Development Law unravelled the discrepancy between railway planning and regional planning and made extensive regional development possible. (Deininger/Yamamoto 2017: 2; Kurosaki/Ogura 2013: 1).

Based on this, rather than Kashiwa City, Chiba Prefecture was in charge of deciding the zoning regulation (Figure 16) and the land-use plan (Figure 15) for the LR area, though in liaison with the city administration. LR is a traditional approach based on the 1954 Land Readjustment Act (*Tochi Kukaku Seiri Hô*), (cf. Sorensen 2005: 122ff.; Souza et al. 2018: 83).

To cope with the urban sprawl problems of Kashiwa City caused by the aforementioned poor planning and driven by exponential population growth and the temporary financial possibilities of the bubble economy, a large LR area was defined (Figure 15). Next, the Urban Renaissance Agency (UR, *Dokuritsu gyōsei hōjin Toshi saisei kikō*), an incorporated administrative agency of the Japanese government commenced a stakeholder consultation project to form a committee of local actors to discuss the extent to which the LR area could be used for urban development (Interview 02, Annex 4). The UR was involved as an umbrella organisation in order to ascertain the development possibilities offered by the construction of the TX in terms of the 1989 National Integrated Development Law for all planned stations (Kurosaki/Ogura 2013: 10; UR 2019: 28). The overall objective is to relieve pressure on the Tokyo core area by creating service core cities in the Tokyo area. To this end, the UR liaises with the Tokyo Metropolitan Government (Bähr/Jürgens 2009: 219). It should therefore be emphasised that the construction of the TX railway and the Kashiwa-no-ha Campus Station are central exogenous drivers that led to the development of today's smart city in Kashiwa-no-ha (Figure 13).

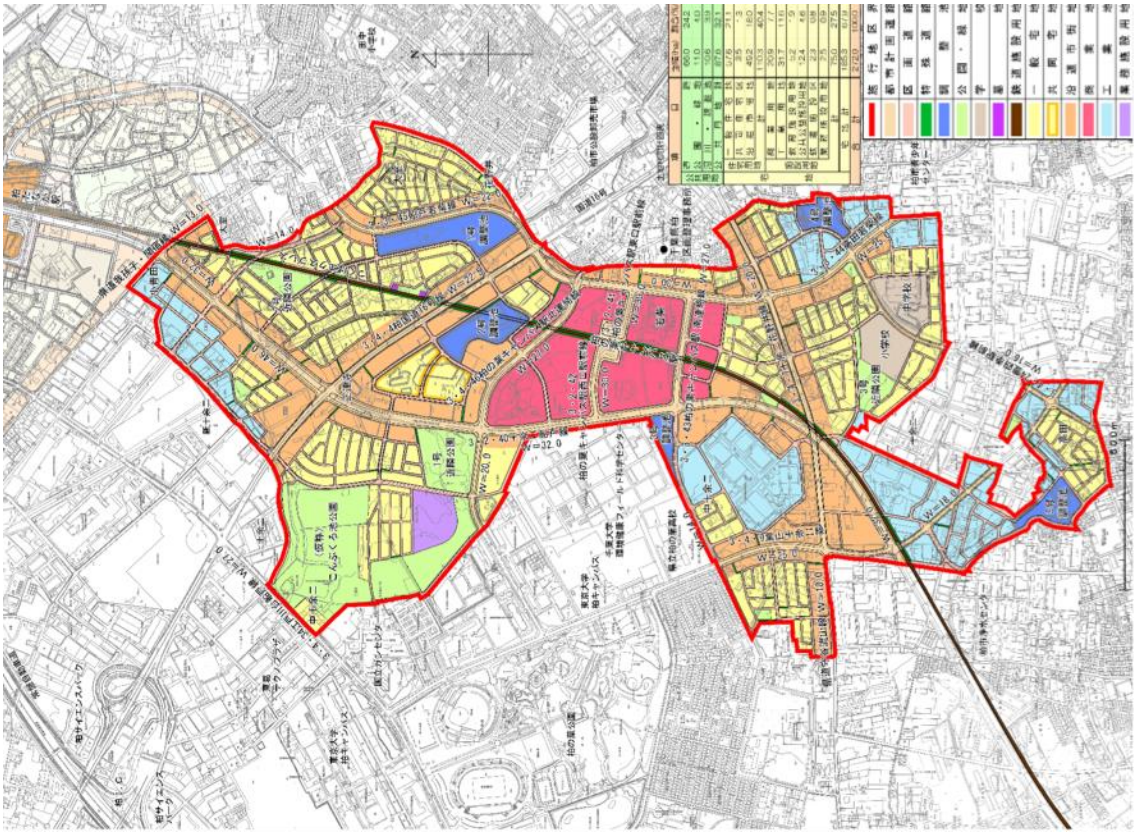

Figure 15 **LR Office Land-Use Map. The area bordered in red is the current implementation area of Kashiwa-no-ha Smart City. An expansion of the project is planned: first and second priority areas (Source: Own representation changed after Chiba Prefecture 2019).**

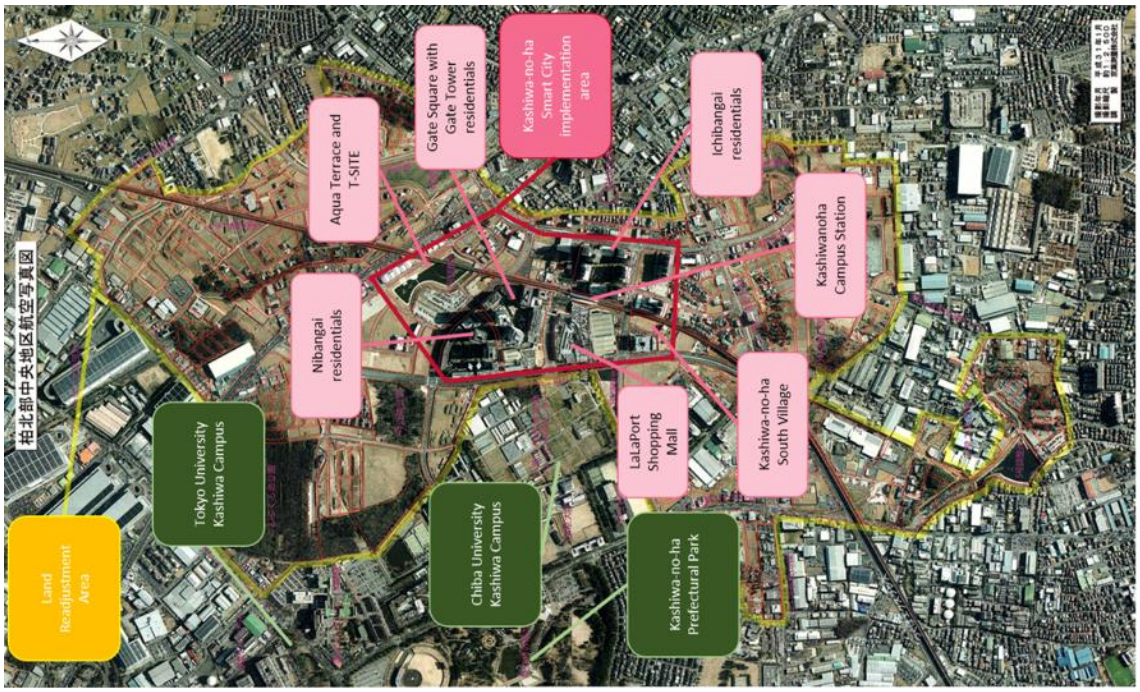

Figure 16 **LR office intervention map with existing Kashiwa-no-ha Smart City structures surrounding the Kashiwa-no-ha Campus Station in 2018 (Source: Own representation changed after Chiba Prefecture 2019).**

In the 1990s, when the Land Readjustment Project and parallel the stakeholder consultation process began, MF, the Metropolitan Intercity Railways Company, the Tanaka Region Hometown Council, the Kashiwa Chamber of Commerce and Industry, Kashiwa City and its subordinate administrations as well as the University of Tokyo and Chiba University were current actors located in or adjacent to the LR area at that time (Figure 14). As mentioned above, initially, MF owned less than 20% of the land in the project area and the rest of the land was split between 900 landowners. The company used the facilities for business talks with clients, many of whom were fee-paying members of the golf club and therefore opposed the development. Sorensen (as cited in Souza et al. 2018: 54) once asserted that opposition and lack of consensus regarding the operation of LR in Japan may be common and not the exception. According to Chiba Prefecture's LR Office (Interview 02, Annex 4), there was also a huge anti-movement of residents and landowners and it was hence difficult to initiate the project. At today's location of Kashiwa-no-ha's smart city, MF was the only landowner, which is why LR and project advanced the fastest there. But, there are still landowner in the LR area (outside the smart city area which are relevant for further expansions of the project, see Field trip 04, Annex 5) who have still mistrust towards the project and accordingly opposed its implementation and still do.

Only because MF was trying to ease debts caused by the bursting of the bubble economy did they agree to sell a 40% share of their land in the LR area to the LR office of Chiba Prefecture (Interview 01, Annex 4). MF gave the share of their property to the LR Office in exchange for the right to build the necessary infrastructure. Part of the agreement is that MF has a first right of refusal to buy land back from the City or Prefecture at the current price of land in the area. That was part of their deal to subdivide the land in order to pay for the improvement as a whole (Interview 12, Annex 4). In the late 1990s, the construction of the TX was launched and finished in 2005.

Parallel to these developments, the local actors, with the help of the BR, formed a steering committee which acts as a management system for urban development in the area. Due to a lack of financial power, the private company MF had not been a member of the steering committee until 2003. When, at this point, the company's fiscal situation stabilised again, Kashiwa-no-ha was right about to start with the first development steps and MF was interested in using this possibility for investments (Interview 01, Annex 4).

Academic actors, especially the University of Tokyo, was highly interested in urban development within the LR area. The University planned to open a new satellite campus based on an urban living lab approach next to the new TX Kashiwa station. In the urban living lab approach, scientists not only play an observational role but are also involved in shaping the real experiment. In addition, they assume a moderating role between the municipal, private sector, and civil society actors involved in the experiment and develop recommendations for the future implementation of the results and their transferability to other municipalities (Bauriedl 2018: 83). This means that the central role that the University of Tokyo plays in the Kashiwa-no-ha actor structure is primarily based on the fact that it is one of the actors that was already resident in the project area from the outset and also knew how to position itself. The driving

forces that led to the formation of the actor structure and the strong role of the university are territorial and historical. Kashiwa City uses the enthusiasm of the above-mentioned actors to develop the area into an innovative industrial location despite empty city coffers (Kurata et al. 2013: 244).

It is planned to complete the whole LR project by March 2023. Progress of the construction work was at 60% at the end of March 2018. The main reason for the delayed schedule is the diplomatic and above all lawful way in which the LR office negotiates with landowners who do not wish to sell (Interview 02, Annex 4).

4.1.1 First planning, organisation, negotiation and implementation phase for building, landscaping and piloting community-building

Building and landscaping

Based on the LR Law, the current local developer and previous golf course owner, MF was able to acquire land in Kashiwa-no-ha in exchange for the mixed-use development of the land in the form of large facilities, residential towers, and offices (Nikken Sekkei 2016: 92). In November 2006, LaLaPort shopping mall was launched as the first element of Kashiwa-no-ha. It started with 180 retail outlets, restaurants, and service firm studios (Deininger/Yamamoto 2017: 5). Architect company Jun Mitsui & Associates was hired to design the first two residential developments in the pilot area (ibid.). Park City Kashiwa-no-ha Campus *Ichibangai*, completed in 2008 by MF on the opposite side of Kashiwa-no-ha Campus Station from LaLaPort (Figure 16) consists of five towers with 977 residential units (ibid.: 6). Considering the community-building aspect fostered by the PPAP approach, *Ichibangai* is analysed in detail in Chapter 4.1.3. The main target of the first planning, organisation, negotiation, and implementation phase (2006–2010) was the construction of the new town development and then selling condominiums to bring residents and create a community by providing adequate services based on the vision described below (Figure 20).

A vision and its watchman

In several meetings during the construction phase of the TX and the Kashiwa-no-ha Campus Station (1999–2005), the steering committee and the residents living close by negotiated on the kind of urban development could be undertaken in the area. In April 2006, they formulated the draft concept of 'Kashiwa-no-ha International Campus Town Initiative', an international academic city based on a public, private, and academic partnership (Interview 02, Annex 4). For the implementation of this project, they delimited a 13 km² area that includes mainly the area surrounding the train station in the central zone of northern Kashiwa City (Figure 15).

According to Kurata et al (2013: 240), the final masterplan of the initiative was jointly published by Chiba Prefecture, Kashiwa City, Tokyo University, and Chiba University in March 2008. The overall goal is to create the international campus city through the efforts of the entire community by implementing innovative policies and planning issues to address national sustainability. These actors formulated three guiding principles: 1) an Environmental-symbiotic city to address climate change, 2) a City of health and longevity to address an ultra-ageing society, and 3) a City of new

industry creation to address low economic growth (Deininger/Yamamoto 2017: 3) These visions are connected to eight goals and 27 further sub-policies (Kashiwa-no-ha Campus Town Initiative Committee 2014: 7):

1 | Sustainable garden city
2 | Creative culture and industry
3 | International academic community
4 | Low carbon transportation system
5 | Suburban style of living
6 | Participation and partnership
7 | High-quality urban space
8 | Innovation field

Already in 2006, Prof Takeru Kitazawa, who formerly worked in the department of urban design in the municipal office of a city and since 1997 has been employed by University of Tokyo, recommended to Kashiwa City that to implement such concept, the establishment of an urban design centre was necessary (UDCK 2017).

In September 2006, the framework from the UDCK was completed. In October 2006, the outline, basic management policy, and executive selection of the UDCK were approved. In November 2006, the UDCK, consisting of representatives of each party of the originally steering committee was launched under the direction of Prof. Kitazawa (Interview 02, Annex 4).

The PPAP also manifested itself as spatially effective by establishing a physical meeting place near the train station for the representatives of the various groups of actors and for residents. With the progress of the project, the UDCK has changed premises several times (Figure 17). Expenses for facilities and goods, labour costs for management, and activity expenses are shared among the actors (UDCK 2017). With a few exceptions, staff members who are involved in UDCK do so in parallel to their regular jobs and are not get paid as UDCK members: ‘They are working for the good of the entire city and not for a specific party. That fact is really special’ (Interview 01, Annex 4).

Figure 17 **Top left: The first building of the UDCK, from 2006–2010. Top right: the second building of the UDCK, from 2010–2014 (Source: UDCK 2017). Bottom: Current UDCK headquarters at Gate Square next to the University of Tokyo Satellite campus, since 2014 (Own image).**

The UDCK was founded as an unincorporated association that aims to be managed collectively and voluntarily by representatives of seven constituents of three different stakeholder groups: Kashiwa City as public actor; MF, Metropolitan Intercity Railway Company, Kashiwa Chamber of Commerce and Industry, and Tanaka Region Hometown Council as private actors; and the University of Tokyo and Chiba University as academic actors (Figure 18). The basic principle of the UDCK is a PPAP in order to avoid the traditional centralised approach of Japanese urban planning (see Kevenhörster 2017: 148) and to implement an urban living lab (Kurata et al. 2013: 242).

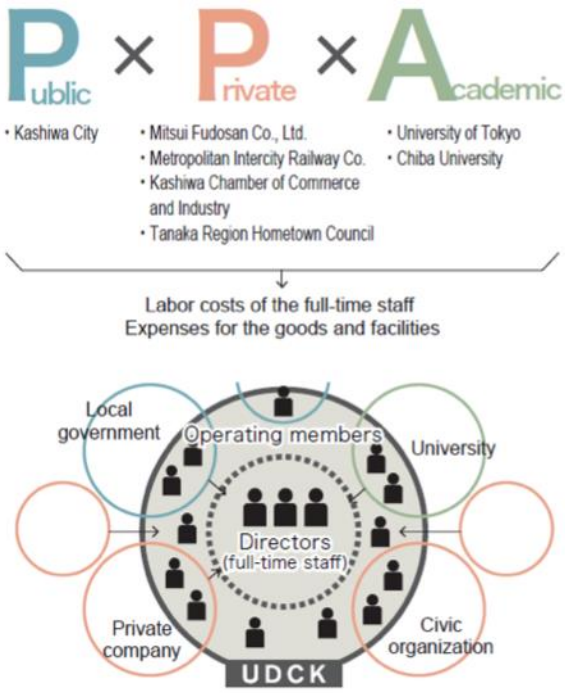

Figure 18 Actor structure of the UDCK (Source: UDCK 2019).

According to several interviewed experts (Interviews 01, 02, 03, 04, 07, Annex 4), the masterplan does not function as contract between the actors but rather as a vision to channel their different interests. Hence, it is a formal institution that is implemented informally. The UDCK acts as a watchman of the vision and mediates between the local actors to strive to attain the eight stated goals and, eventually, their 27 policies (Interview 01, Annex 4). To this end, it established a working group comprising representatives of every actor/stakeholder group for each of the eight goals of the masterplan (Interview 04, Annex 1). Since the staff in the participating groups of actors change at regular intervals, it is important that the UDCK ensures a flexible stability with the purpose to protect jointly agreed interests. The fact that this does not always succeed is explained below (Interview 01, 04, 06, Annex 4). In this context, the intermediary actor in the form of the UDCK assumes three functions: a think tank to carry out 'investigation, research and proposals' for a new city development; a coordinator to promote projects through 'coordination and support' of actual development; and a body to 'dispatch information' to call for participation (UDCK 2017). Therefore, the role of the UDCK is to implement an innovative and holistic *machizukuri* approach in Kashiwa-no-ha Smart City (Interview 01, Annex 4).

According to Hüstebeck (2014: 89f.), in Japan, a distinction is made between *toshi keikaku* and *machizukuri*. The term *toshi keikaku* is used in the context of large-scale urban planning projects and is often associated with conventional planning processes controlled by the municipality or prefecture administration. The term *machizukuri* refers to a locally limited development of individual urban district projects, which are usually concerned with improving the quality of life in the residential environment. In contrast to the top-down implementation of urban planning tasks (*toshi keikaku*), *machizukuri* is usually characterised by partnership-based cooperative projects between community administrations and local residents, that is, a Japanese Governance model. Furthermore, the UDCK strives for *machizukuri* which is

not only based on participation (*sankagata-machizukuri*) but is carried completely by the residents, that is, it wants to lead them to self-regulation (*jūmin jichi*), because UDCK will cease to exist once implementation is complete (Interviews 9 & 10, Annex 4).

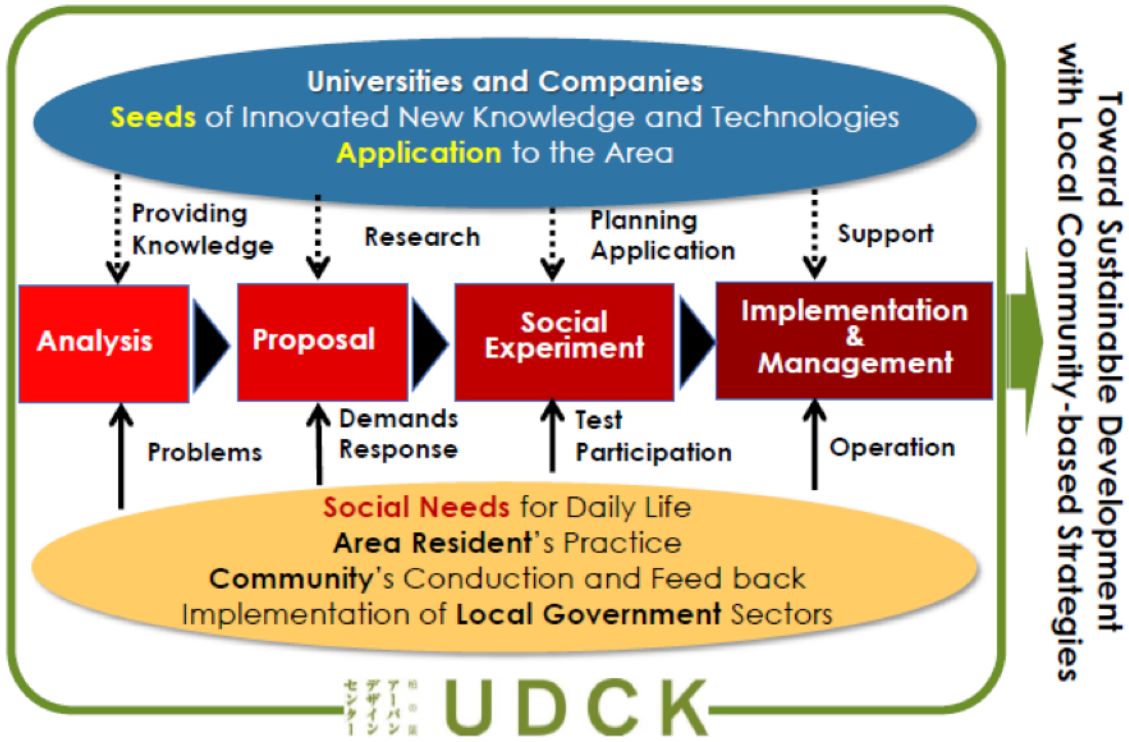

Figure 19 Urban living lab scheme of Kashiwa-no-ha (Source: Ueno 2018: 20).

In addition to creating the masterplan and coordinating with local actors in this regard, the major role of the UDCK is to provide activities and organising projects with and for the new residents following the stated urban living lab approach (UDCK 2016: 11-13). A selection of projects that the UDCK has implemented in cooperation with other local actors is presented below. These projects are part of a series of projects implemented within the urban living lab approach (Figure 19). In order to maintain the focus of this thesis and not to exceed its scope, only those projects that have contributed to the development of the current spatial structure of Kashiwa-no-ha through their applied governance and which still exist today are analysed.

According to the UDCK (2017), the Machizukuri School is part of their area management approach. In this context, the intermediate actor intends to create a place or a programme with the help of which residents and universities can cooperate with each other in terms of urban design. A further goal of the Machizukuri School is the promotion of new participants and managers in the field of community-building. To this end, leading researchers and practitioners in the field are invited to speak on various topics, so that the Machizukuri School works more like a conference (*machizukuri kyōgiaki*). As a rule, the focus is on local application examples in Kashiwa-no-ha and its surroundings. In addition to practical learning about theories and leading projects in this field, which appeals especially to participants with a professional background, the Machizukuri School serves as an open communication and discussion platform

for people from the civilian population who are interested in urban design (ibid.). Attendants have to pay a fee of 3,000 to 5,000 Yen, which amounts 25–40 Euro. Some of the residents see this as a hurdle that curtails participation by average residents who have no interest or professional background in *machizukuri* (Interview 06, Annex 4). In the beginning, the periodical seminars focused on professionals in the field. Hence, it is not surprising that, in general, people from outside of Kashiwa-no-ha were among the attendants. Furthermore, when residents from Kashiwa-no-ha joined, it was mostly the elderly who did so (Interview 09, Annex 4). That was a problem in a resident's opinion (Interview 06, Annex 4) because the attendees were eventually too old and did not have the energy or personal resources to do something in the city. Later, with a new director in charge, the focus switched to more of a kind of learning group (*machizukuri benkyōkai*) to activate residents for participation. This was able to produce a few bottom-up initiatives in Kashiwa-no-ha (Interviews 06 & 11, Annex 4). As a result of this change, the number of participants was decreasing, so the director started to follow both paths (Interview 10, Annex 4). Recently, a new director was elected for the Machizukuri School, and hence it is not clear what the future will bring. The changes in the focus of Machizukuri School can be seen as a necessary element of the urban living lab approach of the programme is a part.

K Salon is an open gathering hosted by the UDCK for casually discussing the future of community-building based on topics introduced by special guests involved in this (UDCK 2017). K Salon is held on the last Wednesday of every month. It is a horizontal communication platform between staff members of the UDCK, the local universities, local NPOs, residents, and sometimes the developers. The atmosphere is very relaxed and amicable, and the discussions are held while enjoying drinks and food together (see Field trip 05, Annex 5). However, residents have expressed concern that since the beginning of K Salon, it is always the same people who participate and that the group of people who are involved there is not representative of Kashiwa-no-ha (Interview 10, Annex 4). MF holds that K Salon is an important platform for interaction between them and the residents (Interview 04, Annex 4). However, a resident indicates that representatives of MF do not always participate in K Salon. Furthermore, their attendance would not mean that the ideas discussed by residents would be considered by them in their actions. Nevertheless, K Salon and the Machizukuri School seem to function as communication platforms where residents can express ideas, state opinions, exchange contacts, and network to have more of an impact on the development of Kashiwa-no-ha (Interview 10, Annex 4).

According to the UDCK (2017), the Pinocchio Project is an NPO that involves the cooperation of many local facilities as well as the participation of local children and guardians in its planning and operation. The NPO offers a programme named 'Pinocchio Project Day' in which future community leaders, that is, children, learn how a city works by experiencing different jobs in their town. Pinocchio Project is under lead of a director from the UDCK and an external consultant from Collabo, an NPO from Tokyo. The staff consists of 18 high school students who had formerly attended the Pinocchio Project as children and six university students from surrounding universities, though not from the local Tokyo University Satellite or Chiba University. Some of the students went to K Salon to learn about *machizukuri* in Kashiwa-no-ha and then joined the project (Interview 05, Annex 4). The reason for there being two

directors is that the person from the UDCK is soon to retire. In general, the UDCK is undertaking first implementations in area management and wants the people (mostly residents) to continue and eventually maintain the projects. Therefore, having the director from Collabo is an interim solution (ibid.). The Pinocchio Project has experienced conflicts with MF several times, such as when the staff members planned to use facilities owned by the developer for an event day. Although the director of the Pinocchio Project is a UDCK member, it was not possible to convince MF and to find a solution in some cases. The reason for this is that the developer has substantial influence and the internal decision-making system is not transparent (Interview 05, Annex 4). Overall, the Pinocchio Project is an important community-building and participation tool because it works across generations and is therefore a strong actor for social inclusion.

Since the UDCK is responsible for the maintenance of the area around the Campus Station, it has devised various models which require and promote cooperation between the actors and stimulate participation. It also addresses some of the goals of the master plan. Kashihana NPO is a volunteer group that consists of people from Chiba Prefecture, Kashiwa City, Chiba University, and the University of Tokyo as well as participating residents (Interview 06, Annex 4). The idea of this area management founded by the UDCK is for local people to maintain public greenery (UDCK 2017). The role of the residents is to care for the flowers; they are also free to decide which trees are to be planted. The flowers and trees are paid for by Kashiwa City using the public subsidy *Midori no Kikin* (fund for green) as a financial resource. The staff who take care of the greenery were paid a small amount by MF. The subsidy by MF, however, ended due to organisational changes in the company (for further details, see Chapter 4.1.4). The initiative uses Facebook to organise itself as well as for public relations work in order to gain the interest of residents and recruit more volunteer workers. Doing the gardening in the public streets of Kashiwa-no-ha and the outcomes of this are spatially effective actions accomplished by residents. With help of Kashihana NPO, residents are able to actively change their everyday living environment. The greening of public areas Kashiwa-no-ha, which is carried out by a group of voluntary residents also functions as communication with other city dwellers and sends a sign so that others might also participate eventually (Interview 06, Annex 4).

4.1.2 Second planning, organisation, negotiation and implementation phase for place-making and improvement of community-building

The second planning, organisation, negotiating, and implementation phase was strongly influenced (Figure 20) by the Tōhoku earthquake in 2011 which lead to a paradigm shift of Smart City strategies in Japan. On the one hand, the Smart City concept, which is meant to foster the socially and environmentally sustainable development of Kashiwa-no-ha is used by main developer MF as a marketing strategy for place-making (develop and purchase an ‘Kashiwa-no-ha lifestyle’ that is generated by vision shared by all cooperating actors). On the other hand, the actions of the UDCK are led by the desire to improve the community-building aspect which was supported by an international collaboration scheme with consultants from Portland, USA.

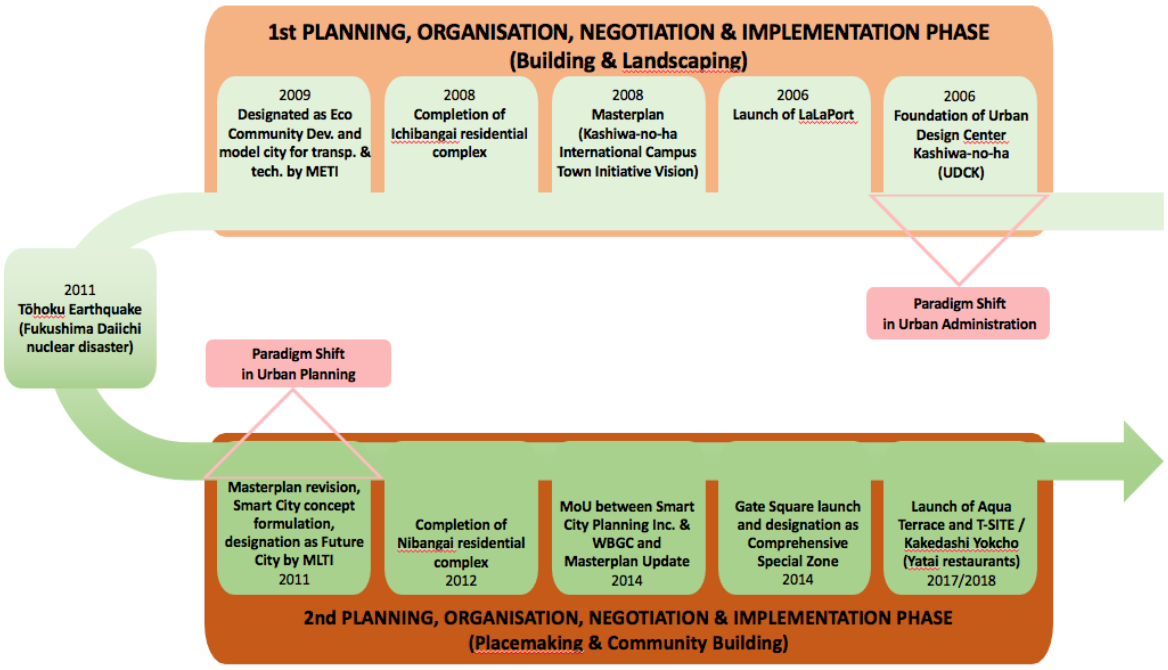

Figure 20 **First and second planning, organisation, negotiation, and implementation phases of Kashiwa-no-ha Smart City. (Own representation).**

In 2009, four smart city pilot cities were selected by the Ministry of Economics, Trade and Industry (METI) to be a testbed for sustainable urban development approaches. The pilot cities were initially technologically deterministically oriented and served primarily to promote the economy and economic interests. Only after the Tōhoku earthquake in March 2011, which among other things resulted in an accident at the Fukushima Daiichi nuclear power plant, did the smart city projects in Japan reorient themselves. The consequences of the earthquake highlighted the vulnerability of the supply network and the dependence on nuclear power for energy generation. This resulted in a paradigm shift that focused on the ecological as well as the social dimension of the smart city. These dimensions were further developed by means of energy efficiency and sustainable use concepts, among other things (EU–Japan Centre for Industrial Cooperation 2014: 12, 24ff).

According to Deininger/Yamamoto (2017: 5), following the disaster, the UDCK coordinated a six-month long comprehensive effort by MF and other stakeholders to revise the original masterplan to address sustainability targets of all three dimensions (social, economic, and environmental). Since that paradigm shift, in addition to the establishment of a 'disaster-ready energy system' and the monitoring and reducing carbon dioxide ($CO_{2)}$ emissions, the fact of demographic change – an ageing and shrinking population due to low birth-rates (cf. Bähr/Jürgens 2009: 217) – has functioned as an additional exogenous driver of the project and has made the actors change the project's course.

After Kashiwa-no-ha successfully applied to be an Eco community and model city for transportation in 2009, the newly formulated smart city concept for Kashiwa-no-ha (mainly promoted by MF and Kashiwa City) successfully applied to be part of the Future City Initiative (FCI), which represents a new era for Japanese smart city projects (Feldhoff 2018: 238 ff.; Loorbach et al. 2016: 35 & 41). This fact is primarily used by

developer MF which uses the smart city branding of Kashiwa-no-ha as a marketing strategy for placemaking (Interview 12, Annex 4). Before that, as indicated in the first master plan, the project was commonly known under the name of Kashiwa-no-ha Innovation Campus Town. Furthermore, Kashiwa-no-ha was declared a Comprehensive Special Zone in the same year. This involves tailor-made, integrated support for comprehensive and strategic challenges in selected regions by granting them, among other regulatory exceptions, special deregulation policies (*kisei-kanwa*). In 2011, when Kashiwa-no-ha was granted Comprehensive Special Zoning, this was mainly used to improve the infrastructure. Chiba Prefecture used it to develop separate lanes for cars, cyclists, and pedestrians (Figure 25). Later, thanks to international cooperation, the deregulation policy was used to improve community-building in Kashiwa-no-ha, which was the main objective of the project in the first half of its implementation.

Citizen science and digital signages for environmental awareness

Based on the project vision, the UDCK established cooperation between Chiba University and the residents, the College Link Program to pursue citizen science. The programme has 'a view on the environment, health, and food where the residents and the university learn from one another' (UDCK 2019). According to Trencher et al. (2015), many citizen science projects focus on climate mitigation and sustainability as a whole and are combined with masters or doctoral student experiments at the university. Furthermore, since the establishment of the disaster-ready energy system, citizens have been provided with information on their energy consumption and corresponding CO_2 emissions on both private and public digital signage installed by MF (Figure 21).

Figure 21 **Public digital signage at Gate Square, Kashiwa-no-ha, showing energy consumption and carbon-dioxide emission data (Own picture).**

Furthermore, the University of Tokyo Campus Satellite in Kashiwa-no-ha shares the individual energy consumption data with a lab on the main campus of Tokyo University. There, the data is analysed, and a feedback is provided to the residents on how they can improve their efficiency (Interview 09, Annex 4). However, the residents here really do not care about that. No one looks at that metre that much and they do not change their consumption behaviour based on the survey outcomes. We as residents really do not know our role here within the smart city concept' (ibid.). This leads to the assumption that the concept is not communicated transparently enough to the residents and emphasises the relevance of a tool for awareness such as the Collage Link Program. In addition, developer MF is pursuing a low CO_2 building design based on the project vision that led to environmental certification for Kashiwa-no-ha Smart City in 2016 and so to a further promotion tool for MF. In addition to the image building within the framework of a marketing strategy, the creation of a sustainable identification symbol for the residents also resonates here (Deguchi 2019; Interview 12, Annex 4).

Residential areas Park City Inn Ichibangai and Nibangai to

address an ageing society and community-building

In 2011, the community-building phase of Kashiwa-no-ha commenced. With the aim to be able to further manage the associated bureaucratic and legal processes that were demanded for further research, planning proposals, and the design management (Interview 01, Annex 4), a General Incorporated Organization (*Ippan Shadan Hōjin,* see Aoki 2008) was founded under the rubric of the unincorporated association. Depending on need, the UDCK either acts as a legal entity or as an association (Interview 01, Annex 4). Thereafter, the UDCK established the Kashiwa-no-ha Community-building Council (*machizukuri kyôgikai*). Residents' activities such as gardening or the city club that were started and supported by the UDCK during the first stage of the development, using the capital of MF, were later supported by the area's capital (usually governmental subsidies) and run by the residents in order to make the area more sustainable. This is how the residents' council was founded in 2011 (Interview 11, Annex 4). The council works as a parent organisation for local actions. The council joins in sort out local problems and keep up and enhancing the living environment. The UDCK engages in manage this council and fostering these local actions (UDCK 2017).

From 2008 to 2012, MF developed the residential districts of *Ichibangai* and *Nibangai*. Each district comprises around 300ha, with several high-rise condominiums separated by public green spaces. Each condominium has facilities on the ground floor, such as gyms, libraries, common spaces, community cafés, a basket court, music studios, and a party lounge (Figure 22). The green spaces are public, but the condominiums and the facilities inside them are gated and only accessible to the residents living in the particular condominium. The Kashiwa-no-ha Community-building Council is a local division of the Community Collaboration Council and controls the Community-management Councils of *Ichibangai* and *Nibangai* and later also of the Gate Tower residential buildings at Gate Square. This is a top-down scheme for creating a community and compelling participation. Therefore, when MF began to rent out the residentials in *Ichibangai* and *Nibangai*, it had to insert a clause in the rental contracts that obliges residents to be part of their local Community-management Council and organise public events and the like. At this point, it should be noted that, culturally, Japanese have no problem being obligated to engage in such community tasks (cf. Sugiman 1998: 54). It is not usual for a developer to take care of such matters. However, due to the special discussion culture of the UDCK in form of monthly meeting for each of the eight goals of the masterplan to explore possible synergistic effects between the interests of the actors, this became possible (Interview 01; 04; 09, Annex 4).

Figure 22 ***Ichibangai*** **and** ***Nibangai*** **residential complexes. Community-management Council neighbourhood events, gated 'common' facilities such as libraries and meeting rooms, a notice board, and a Porsche as a symbol of the kind of people who live there (Own images, see Field trip 02 & 08, Annex 5 for more details).**

The Community-management Councils of *Ichibangai* and *Nibangai* held neighbourhood events, such as the 'Everyone Is Welcome', which are organised autonomously and in coordination with the Community-building Council and the Community Collaboration Council. These events are spatially very effective: they provide food, open the gated 'common' facilities to everyone, or offer games for children. Developer MF participates in such self-managed events for the sake of their publicity (Figure 22). The top-down Community-management Councils are formal institutions that aim to bring most of all young and busy residents, who usually use Kashiwa-no-ha as a commuter town, into the community and allow them to participate (Interview 09, Annex 4). Old, established residents say that the people of Kashiwa-no-ha are young and busy working and do not want to or cannot participate. The offers of UDC2, the Urban Design Center spin-off in Kashiwa city centre, are accepted to a greater extent (in terms of number of participating residents) and are used by the residents as the Kashiwa city centre, as a district in stock, faces several problems and therefore people have issues they want to solve (Interview 06, Annex 4). They take advantage of a facility such as UDC2 to change what they can. The people of Kashiwa-no-ha experience the UDCK as a service and do not feel the need to participate – for them it is more like a kind offer that is presented to them. They see themselves more as customers than as active members of the community (Interview 06, Annex 4). This is

why it is important that the UDCK offers channels that relate to *machizukuri* that range from the Machizukuri School to drinking parties (Interview 11, Annex 4).

Integrated urban effects of Kashiwa-no-ha

The residents are mostly under the age of 10 and in their 30s and 40s (Interview 05, Annex 4); they are upper-middle class retired couples and young families who live mostly in luxurious apartment towers (Trencher/Karvonen 2019: 262). The population of the surrounding City of Kashiwa is in comparison much older (average age: 45), mainly people between 40 and 50 and between 60 and 70 years of age (Statistics Bureau Japan 2015). The socio-economic differences between Kashiwa-no-ha and the surrounding Kashiwa City can also be seen in relation to rents (Trencher/Karvonen 2019: 262). A 70m² condominium in Kashiwa-no-ha costs up to 40,000,000 Yen, about 335,000 Euros (Field trip 03, Annex 5). In comparison, a 70m² apartment in the centre of Kashiwa City, that is, in a prime location, costs 24,500,000 Yen, approximately 200,000 Euros (Numbeo 2019). Nevertheless, the prices in Kashiwa-no-ha are cheap than in Tokyo, where a 70m² condominium costs about 100,000,000 Yen, about 830,000 Euros (ibid).

Kashiwa-no-ha also demonstrates the integrated urban effect of these disparities. In 2014, in the LaLaPort mall, the Town Health Center ASHITA was founded. This includes various healthcare practices and research institutes to pursue the smart city's guiding principle of 'Health and Longevity' by means of preventative health rather than medical treatment (Interview 04, Annex 4). ASHITA is people-oriented bottom-up approach to advancing the health of residents by the University of Tokyo, with assistance of developer MF and sponsoring corporations. It is a free-of-charge centre does not require a prior appointment and is run by residents for residents. By permitting membership to residents of the surrounding areas outside the smart city, the centre provides an important avenue for sharing benefits beyond Kashiwa-no-ha (Trencher/Karvonen 2019: 265). Community ownership of the centre's preventative health agenda has increased especially since the University of Tokyo withdrew after initial research funds were depleted. However, it should be emphasised that the participating residents are all seniors and hence do not belong to the main resident group (ibid.: 266).

International collaboration for improving community-building

The top-down interventions implemented thus far and described in the previous sections of this chapter have provided a participative basis in Kashiwa-no-ha but have not led to an authentic and lively cityscape. A major deficit is that there are no appropriate public places (in the sense of a right to a city and to the formation of social capital) available, since there are only the green spaces between the residential buildings and the shopping mall (Interview 12, Annex 4). The solution included a far-reaching collaboration between the *We Build Green Cities* (WBGC) consortium, Nikken Sekkei, the UDCK, Kashiwa City, and MF (Figure 23).

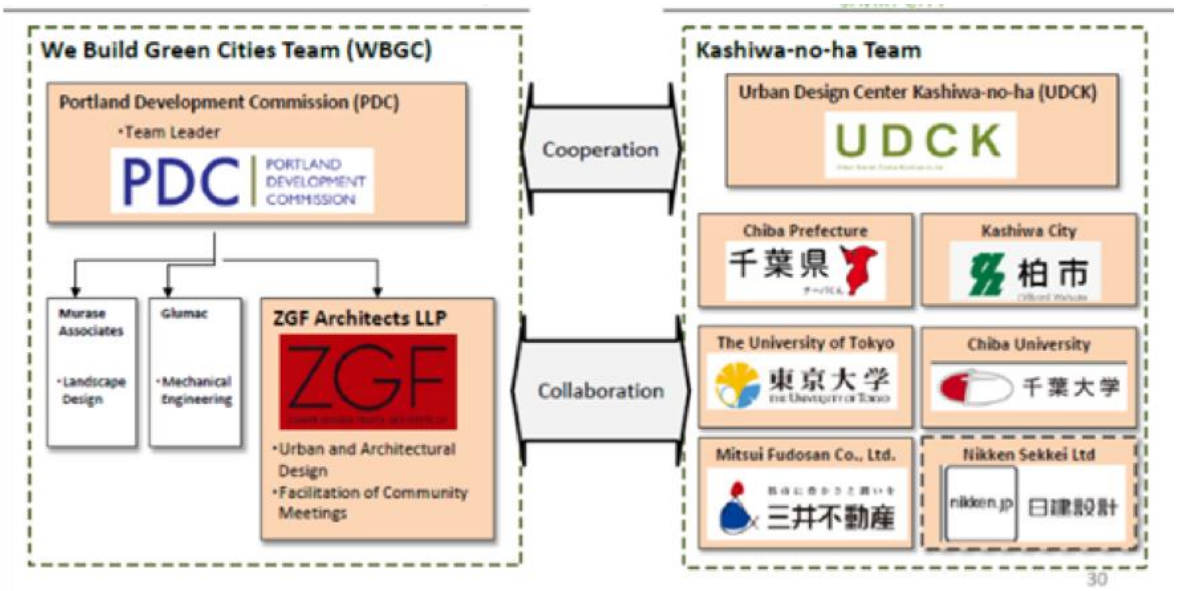

Figure 23 Cooperation and collaboration network of Kashiwa-no-ha Smart City (Source: Kashiwa City 2015).

In 2013, WBGC met with people from Smart City Planning Inc. and MF (both brand, market, and develop Kashiwa-no-ha) at a showcase event for sustainable urban development in Japan. The consortium (comprising ZGF Architects, the Portland Development Commission (PDC), Glumac Engineers, and Murase Associates Landscape Architects) was the bilateral trade organisation that allowed the City of Portland to export Green Planning Technology. US President Obama created a programme by means of which cities could apply to receive a grant of federal money to directly export the products and services of local businesses. As Kashiwa-no-ha Smart City needed to improve its community-building, they started a collaboration. With help of community meetings, WBGC identified the outcomes members of the community wanted that were shared by stakeholders. One of the desired results was the activation of the streets, in the sense that residents stay there and spend their free time. However, the spatial conditions were lacking (Deininger/Yamamoto 2017: 4).

Both the PDC and ZGF had experience developing the eco district idea (Portland Pearl District). This idea was supported by ZGF's experience in sustainable development at the building and district scale. The eco-district concept of Portland, of which ZGF is a founder, works to prioritise community goals and give the community more autonomy regarding the success of the outcomes they achieve by their actions. In 2014, based on eco-district concept of Portland, WBGC formulated the eco district Vision for Kashiwa-no-ha with the community and obtained a contract with MF to do a zoning/land-use plan that organised all ideas and outcomes of the Kashiwa-no-ha community meetings into a strategy that could be adopted by the city for implementation in partnership with the private sector. After the completion of the zoning/land-use plan in 2015, Nikken Sekkei, which had compiled the original zoning/land-use plan in collaboration with public administration of Kashiwa-no-ha, distilled elements of the WBGC plan into a regulatory document for the City of Kashiwa and Chiba Prefecture (Interview 12, Annex 4).

Figure 24 **Kashiwa-no-ha campus station. An outcome of deregulation policy through the Comprehensive Special Zone Subsidy, the west wing is managed and maintained by the UDCK and the east wing by Kashiwa City. This is shown by the Logo of Kashiwa City on the ground. The side of the street managed by the UDCK can now be used to place tables, benches, and the like (Own images).**

However, the use and provision of public spaces in Japanese cities is a particular challenge partly due to strong historically dependent use regulations (see Sorensen/Funck 2007: 272; Sorensen 2005: 43). In order to achieve the urban conditions described in the Kashiwa-no-ha vision on the basis of the intervention measures developed by WBGC along the lines of the Portland eco district, it is mandatory to use public streets to foster communication. Therefore, it was necessary to pursue a deregulation (*kisei kanwa*) policy (see Sorensen 2005: 85ff); this had already been granted to Kashiwa-no-ha by the Comprehensive Special Zoning programme in the form of a subsidy. With the subsidy, Kashiwa City developed an Urban Reconstruction Plan to serve as the legal basis for utilising road occupancy around the area of the station's west exit. The plan regulates the use, construction, and maintenance costs as well as the management of the west wing of Kashiwa-no-ha Campus Station at which most of the smart city's facilities are located (cf. Nanjo 2016). The UDCK has committed itself to bearing the management and maintenance costs itself as an 'Corporation for promoting urban renovation' appointed by Kashiwa City (Interview 12, Annex 4). In addition, it must report on the condition to the landowners mostly living in the surrounding urban areas and the city at regular intervals. In return, the city of Kashiwa bears the construction costs. Furthermore, the owner of the adjacent building is obliged to bear the costs that exceed the maintenance

costs. Through this management system, the city is thus relieved of any follow-up costs and transfers responsibility to the organisation (Nanjo 2016). As can be seen in the illustrations (Figure 24), new public spaces have been made accessible as a result and, since 2015, many passageways have been used for public interventions in community-building. In addition, the UDCK promotes the development of public spaces in cooperation with residents, for example, as part of the community development programme, which involves city dwellers in the design of public spaces or develops them jointly (Deguchi 2017).

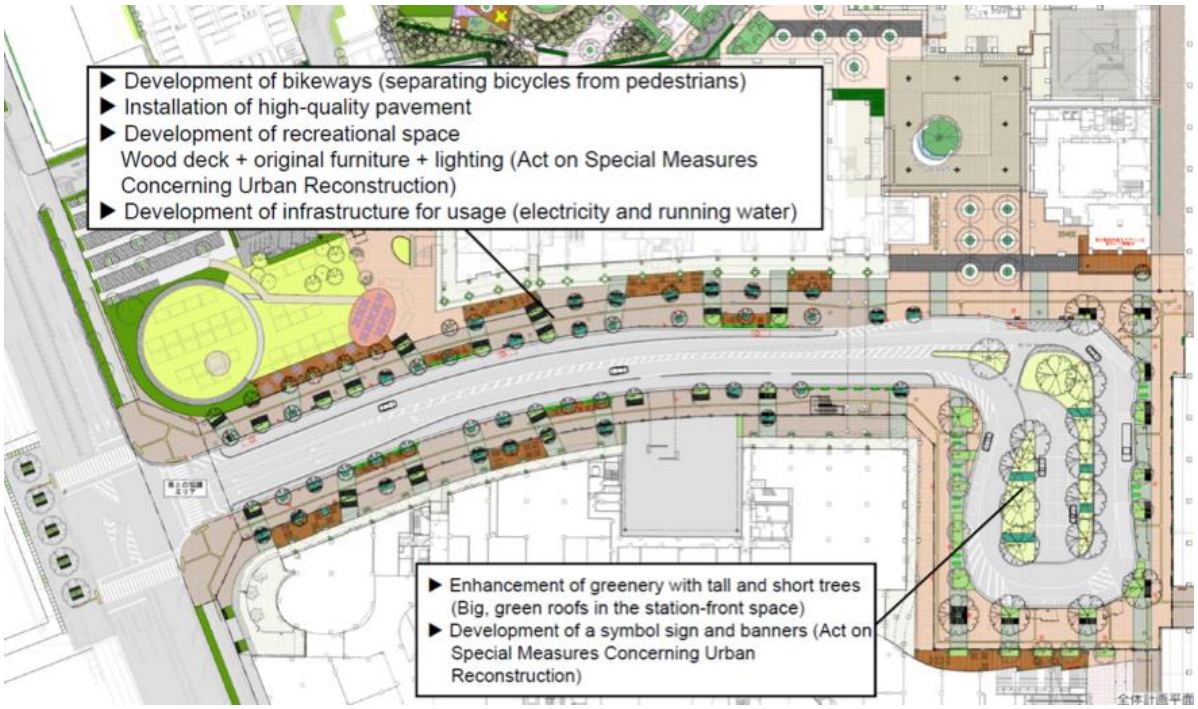

Figure 25 Deregulation leads to separate pathways for pedestrians, bicycles, and cars (Source: Nanjo 2016). For details please see Field trip 01, Annex 5.

This deregulation of the use of public spaces has only been made possible by the UDCK assuming responsibility. In order for it to be able to take over this task, a legal entity was necessary. During this period, the UDCK used the already existing Urban Design Center Kashiwa-no-ha General Incorporated Organization, which was actually established for research-focused tasks.

Further internationalisation efforts

With the International Campus Town Initiative, Kashiwa-no-ha has formulated a clear vision of internationalisation, which is expressed in goal three: 'form an international space of academia, education and culture' (Kashiwa-no-ha Campus Town Initiative Committee 2014: 7). There is also a working group for this purpose (University of Tokyo 2016). As a resilience strategy for an ageing society, the integration of immigrants of all social classes is a priority. Kashiwa-no-ha, however, focuses its internationalisation strategy on academic exchanges, such as the collaboration with WBGC discussed above or guest stays by international professors and students as well as the recent influx of well-trained workers from technology companies in the

course of the InnovationField Kashiwa-no-ha development strategy (see the next chapter). Accordingly, Kashiwa-no-ha Smart City is highly selective internationally. For this purpose, the Kashiwa-no-ha International Village was established which comprises a few rentable rooms for an affordable price in the Mitsui Garden Hotel and an English-speaking guide to answer questions from guests (Interview 04, Annex 4). The main actor here is MF in cooperation with the University of Tokyo. The proportion of the population with an immigration background is just over 2% for the whole of Kashiwa City, which has more than 400,000 inhabitants. Due to the selective internationalisation policy and the high cost of living in Kashiwa-no-ha, immigrants are not likely to be found in the smart city (Kashiwa City 2018).

Aqua Terrace and T-SITE: Kashiwa-no-ha's first public urban spaces appropriated by residents

Another space-effective intervention of the local actors' network with the support of international experts is Aqua Terrace in the north of the smart city project and the T-SITE located right next to it. The extended zoning/land-use plan, which was also used for the utilisation of road occupancy, acted as a formal planning tool here too. Kashiwa City, and so Kashiwa-no-ha, adopted the guidelines that supported envisioned improvements for implementation by MF and the UDCK. The Aqua Terrace project was established by aligning the standards for development with projects formed to achieve the vision of Kashiwa-no-ha (Interview 12, Annex 4). The Aqua Terrace concept is based on the SW EcoDistrict in Washington DC, implemented by ZGF, a new design of 10th Street to capture and reuse stormwater (stormwater credits are generated by retaining surface runoff in the district) to pay for a new open space system. The central common space of the Aqua Terrace also involves managing stormwater. In this context it is an applied travelling concept.

Figure 26 **Old status left and new status right. Source: Nanjo 2016. For details see Field trip 06, Annex 5.**

According to Nanjo (2016), before its development, the Aqua Terrace, located north of Kashiwa-no-ha station, was an inaccessible drainage water basin (Figure 26). Access to it was blocked by a fence more than two metres high, and the area was sepa-

rated from the northern and southern parts of the project area by the LR zoning (Figure 15). In 2014, development of the area began. This was completed in early 2017 and made the water area publicly accessible. Previously, the LR Office had built the drainage water basin which was used as the base for the Aqua Terrace. This reservoir was maintained by the LR office following the opening of the TX line. Nikken Sekkei was commissioned to design the Aqua Terrace.

As with the design of the deregulation agreement for Kashiwa-no-ha station's west exit, the UDCK took over management and maintenance, in this case financed by levies from the surrounding landowners (ibid.). The LR Office could not spend much money on the construction (Interview 02, Annex 4). Therefore, the collaboration helped substantially to find ways to finally implement the project as it had been imagined. The costs of the conversion were borne by the owner of the surrounding properties, MF, which developed the area in close cooperation with the UDCK. The negotiation processes among the actors (Figure 27) for developing the Aqua Terrace and T-SITE was discussed in some of the UDCK meetings to pursue the vision' goals (Interview 04, Annex 4). There have not been conflicts, merely issues, among the collaborating actors. When the meetings did not come to a successful conclusion, the UDCK had informal talks with each stakeholder to find a way to move forward (Interview 12, Annex 4). Aqua Terrace was opened in 2017 (Figure 26). In connection with the Aqua Terrace project, an integrated effect of Kashiwa-no-ha on the surrounding city of Kashiwa can again be observed. The UDCK commissioned a neighbourhood organisation of the adjacent residential area of Kashiwa Tanaka to manage the opening and closure of the Aqua Terrace (Interview 07, Annex 4).

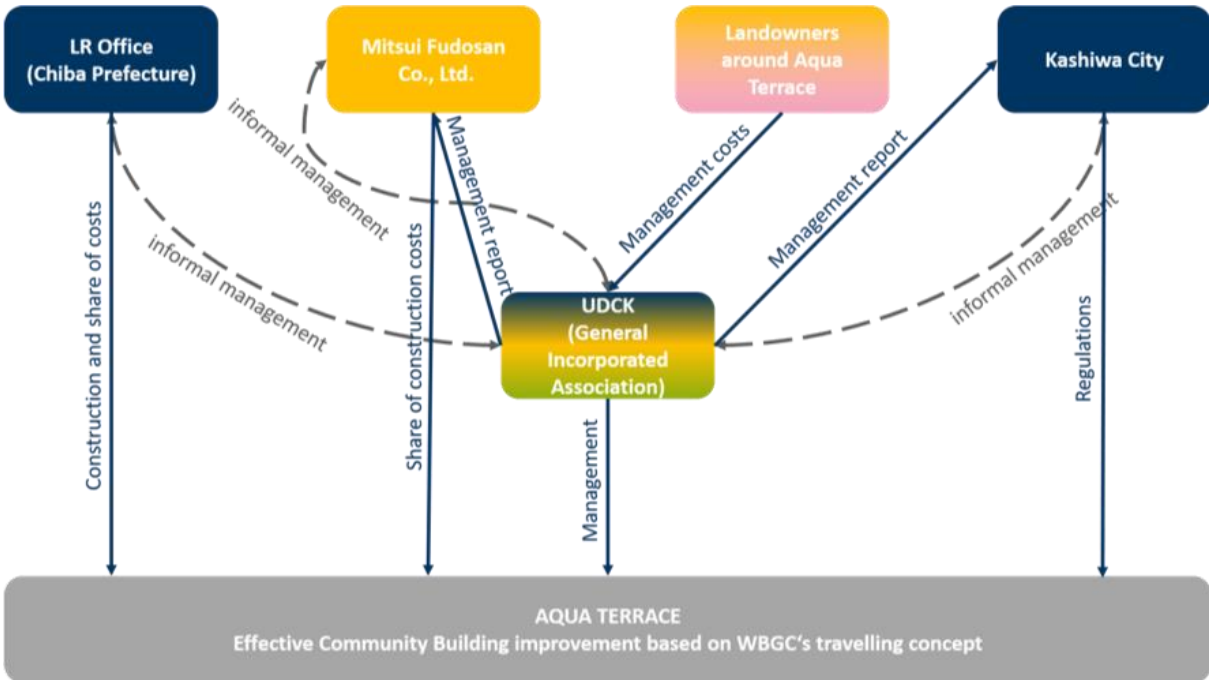

Figure 27 Actor networking for realisation of Aqua Terrace project (Own representation).

Parallel to the renewal of the water surface, the bookstore T-SITE, with an integrated café, was built directly adjacent to the Aqua Terrace (Figure 28). The bookstore was supplemented by private companies such as restaurants, cafes, VIVITA (an NPO

striving for establishing a local co-creation community), and the like. The combination of a blue infrastructure and a bookstore with a café near the campus station has considerably increased the potential of the area in the sense of creating social capital as it attracts people from the neighbouring districts of Kashiwa City to spend their free time there and get in touch with people from Kashiwa-no-ha.

Figure 28 T-SITE at Aqua Terrace (Own images). For details see Field trip 06, Annex 5.

Furthermore, the newly acquired public urban space in the form of the Aqua Terrace was the first of its kind to be appropriated by residents, who held a bottom-up event (*Jūmin undo)* at the facilities in October 2018. The kick-off for the Aqua Terrace event was an idea competition among participants of the Machizukuri School (Interview 06, Annex 4). Initially, the civil organiser had trouble finding people among the residents to work with on the project (Interview 10, Annex 4). At some point during one of the *K Salon* events, an organisation committee was established together with the community manager of the NPO, VIVITA (located at T-SITE), who is also a resident. VIVITA used the event as a platform for their approach of establishing a creative society in Kashiwa-no-ha (see the next chapter). The Aqua Terrace Committee held a bottom-up event regardless of the city or the developers but with financial

support of Kashiwa-no-ha's Community-building Council. They needed many permissions and information about how to use the space. On this point, the committee approached to UDCK to obtain help with the bureaucracy. They used the event application online tool of the UDCK website. The PPAP mediated between the committee and the owner, Kashiwa City, which was obstructing the planning of the event mainly because of safety rules (Interview 08; 10, Annex 4).

Nevertheless, the event and its content were organised independently by cooperating residents and had a strong integrated effect on the surrounding districts. Participating groups that organised and offered the Aqua Terrace event programme items were locals and residents from the surrounding districts of Kashiwa City (Interview 08, Annex 4). In addition to building trust between the UDCK and independently acting civil actors, many residents learned about the possibility of renting the Aqua Terrace and designing it themselves only through the implementation of the event (Interview 08, Annex 4). Although the Machizukuri School and the K Salon played a central role as communication platforms in this case, the initial motivation was not initiated by these formats. Rather, the bottom-up participation of the long-established resident of Kashiwa City and later of Kashiwa-no-ha was a personal concern, since he observed and critically reflected on the development of the smart city from the beginning (Interview 06; 10, Annex 4).

4.1.3 Third planning, organisation, negotiation, and implementation phase for creating a setting for investment and community-management

In 1999, when the LR started, 900 landowners were present in Kashiwa-no-ha. Today, almost 10,000 people live in the project area; a total population of 40,000 people is estimated for Kashiwa-no-ha smart city by 2030.

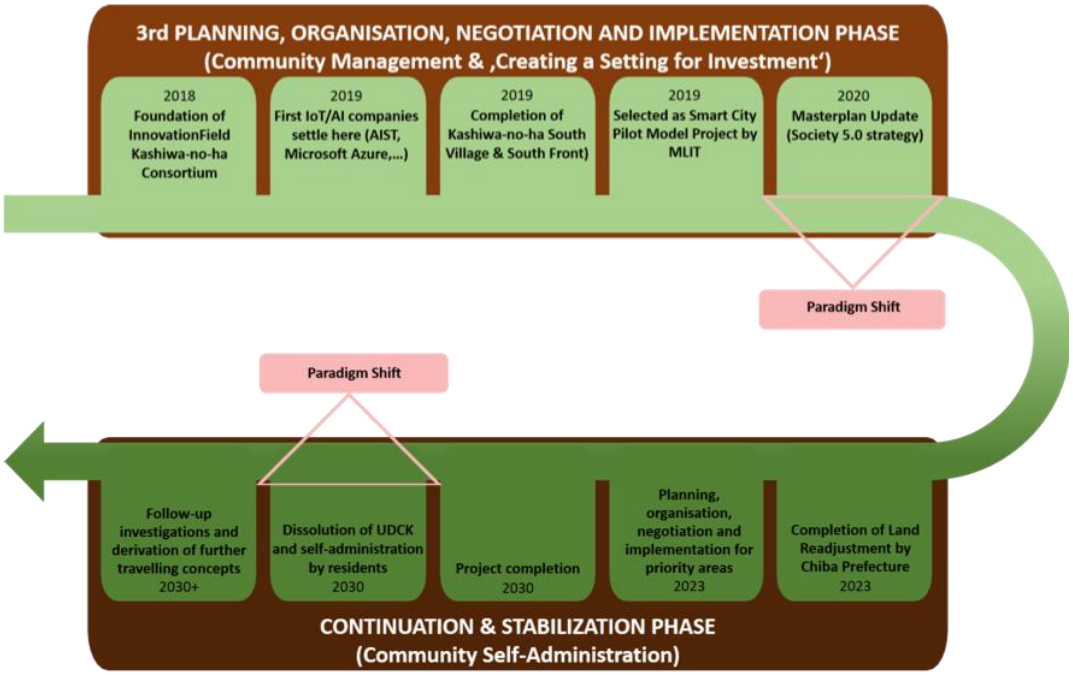

Figure 29 **Third planning, organisation, negotiation, and implementation phases as well as continuation and stabilisation phases of Kashiwa-no-ha Smart City (Own representation).**

The third planning, organisation, negotiation, and implementation phase (Figure 29) is marked by further community-management in order to attract companies by pursuing the creations of 'a setting for investment' and co-Innovation (Deguchi 2019; Interviews 01 and 11, Annex 4). MF, which worked on community-building in the previous phase, is now shifting their focus to more capitalist-oriented spatial interventions (Interview 09, Annex 4). In 2018, with the creation of the InnovationField Kashiwa-no-ha, a paradigm shift is about to occur by focusing the eighth goal of the masterplan, 'becoming an innovation field'. This has been strengthened by an extensive update of the master plan by supplementing a Society 5.0 strategy (explained in detail at the end of this chapter). The first space-effective interventions have been taking place since 2014; however, they have only become increasingly concrete since the end of 2018.

The planning phase shift illustrated by Kakedashi Yokocho project

Participation in leadership positions by the respective local actors of the various stakeholders changes at regular annual intervals and so also do their representatives who participate in the UDCK's organisational meetings. The members from Kashiwa City change every three years and members of MF every five years. Especially when the members from the developer change, this is usually associated with considerable pressure to change the Kashiwa-no-ha project (Interview 06, Annex 4). The role of the UDCK is therefore important to ensure stability and continuity. The community-building phase of the project lasted until about 2014 (the transition is fluid) and during this time MF tried to encourage the residents to participate in *machizukuri* (see Chapters 4.1.1 and 4.1.2). With the change of management of MF and the change in the directorate of UDCK (Kitazawa was replaced by Deguchi, Professor for Socio-Cultural Environmental Studies at University of Tokyo), the second implementation phase in the form of community-management began. This now focuses less on the residents, that is, on social sustainability and more on attracting international companies, that is, economic sustainability (ibid.) This can be seen, among other things, in the fact that the MF client's subsidies for activities by residents, associations and NPOs are being phased out, because in future these will be financed by innovative industries to be established in the area. The financial resources from the numerous support programmes are to be used for the transition (Interview 11, Annex 4).

An example where planning phase shift can be seen spatially is the *Kakedashi Yokocho* project, the establishment of small, traditional food booths (*Yatai*) to improve Kashiwa-no-ha's offers of going-out. Since *Yatai* is a very traditional element of urban space use (see Solt 2014: 22), which used to find between train bridges, it would be very positive to see its successful implementation in a greenfield new town project such as Kashiwa-no-ha. Launched in late 2018 between the TX railways next to Kashiwa-no-ha station (Figure 30), *Kakedashi Yokocho* in Kashiwa-no-ha originated in a bottom-up approach by residents of *Nibangai* and *Ichibangai* to compensate the lack of nightlife facilities in Kashiwa-no-ha in 2010 (Interview 09, Annex 4).

Figure 30 Kakedashi Yokocho (Yatai restaurants) next to Kashiwa-no-ha Campus Station (Own images).

Accordingly, following the urban living lab approach by taking advantage of the Comprehensive Special Zone, the UDCK in cooperation with MF conducted *Yatai* pop-up Events at Gate Square in the following years to prove the demand among the residents for *Kakedashi Yokocho* as a long-term facility (Interview 04, Annex 4). As the events went well and the residents were satisfied, MF created a concept for *Kakedashi Yokocho*, which serves as a sign that MF wants to participate in the *machizukuri* (Interview 01, Annex 4). At first, the idea was to rent the *Yatai* shops at a reasonable rent price (with help of subsidies by MF) and offer them to young entrepreneurs who were wanting to open their own restaurants and bars to initiate a community-building-based development. Eventually, the developer offered a normal rent price without any special discount because the construction land owned by the Metropolitan Railway Company was expensive due to the companies' debts. MF thus made a decision in a most capitalistic manner and did not support community-building by offering fees, which would probably have been different in an earlier phase of the project. This is the reason there are still vacant shops at the venue (Figure 30) (Interview 09, Annex 4). Even though the establishment of *Kakedashi Yokocho* was

not fully successful in this sense, it is positive that new public places for potential social capital formation have been created by means of the *Yatai* shops.

KOIL/31Ventures as a tool for economic and social innovation

MF's development concept for the area around the Kashiwa-no-ha station is Gate Square, the construction of which was completed in 2014 (Deininger/Yamamoto 2017: 4). Gate Square houses the facilities of the University of Tokyo in Kashiwa-no-ha, the north wing of LaLaport, the Mitsui Garden Hotel, Gate Tower East and West (the latter offering the first and only rental apartments in Smart City thus far), the local crisis-proof energy management centre, KOIL, and a large square around which these facilities are located (see Field trip 07, Annex 5).

Figure 31 The Factory' of 31Ventures in KOIL (Source: 31Ventures, 2019).

KOIL was developed by MF in close cooperation with the UDCK. Its proximity to the universities of Chiba and Tokyo, as well as to research facilities, promotes the potential of start-ups and provides space and opportunities for small businesses, NPOs, and civilian entrepreneurs. 31Ventures by MF is located on the top three floors of the KOIL building. Two of these are used as office space and the top floor is referred to as the 'Innovation Floor'. 31Ventures is a coworking space that aims to synergistically bring together knowledge, industry, and culture through the promotion of a PPPP in co-innovation (Interview 01, Appendix 4). It has mediating mentors to support civil entrepreneurs from Kashiwa-no-ha (Interview 04, Appendix 4). The approach aims to provide a space for the creative class (cf. Florida 2002) to innovate and network. 'The Factory' provides users with free access to high-tech equipment such as 3D printers (Figure 31).

Thus, 31Ventures, and thus KOIL, involve the cultivation of new industries and the promotion of innovation. The interest lies in the promotion of economic growth through the creation of a climate of innovation, which in turn should lead to the settlement of companies. Therefore, creating a setting for investment can be seen as a central motive of action here. By leveraging MF broad domestic and international business capabilities, KOIL/31Ventures is building a platform that can comprehensively support the growth of venture companies through community, support and funding, helping them to become active from the local to the global scale (Mitsui Fudosan 2019: 4ff.).

Additionally, KOIL/31 Ventures offers an innovative potential to strengthen gender equality. Gender roles in Japan are still very traditionally distributed – men are responsible for income, women for children and the household. Japan was placed 117th out of 149 in the World Economic Forum's (2018: 13) 'Global Gender Gap Report'. Apart from a national policy that has supported this model for decades, this way of thinking has become entrenched in female generations (see Nyan 2016). Prime Minister Shinzo Abe's government has promoted gender equality as a national growth strategy and has set itself the goal of increasing the proportion of women in leadership positions in Japan to 30% by 2020 – the status quo in 2018 was 7.8% (Baird 2018). In view of demographic change, women are now facing a double burden in Japan. On the one hand, Abe has involved women more in the labour market in order to close the employment gap created by low birth rates and outdated population structures (cf. OECD 2016); however, on the other hand, women should also be motivated to continue playing the role of mother (cf. Kajimoto 2018). Since Kashiwa-no-ha is a place of residence for families, many women find themselves in full-time jobs while being mothers and housewives. However, there are also women in leading positions at the UDCK, MF, and local NPOs and NGOs (Interview 04; 05; 07; 08, Annex 4). In addition, Kashiwa-no-ha offers innovative and above all flexible employment opportunities within the framework of KOIL/31Ventures, which enable women to combine work and motherhood (Interview 11, Annex 4).

Kashiwa-no-ha Smart City's current and future development tendencies

The current project vision, the 'Kashiwa-no-ha International Campus Town Initiative', expires at the end of 2019 and will be continued in the form of a new edition from 2020. This update will increasingly focus on community-management and less on community-building. The latter is to be combined with Japan's Society 5.0 strategy (Interview 02, Annex 4). Society 5.0 was suggested in the 5th Science and Technology Basic Plan as a future society to which Japan should strive for. In Society 5.0, a considerable data volume from sensors in physical spaces is piled up in cyberspace and further analysed by AI to feed back the information-based results in various forms to humans in physical space (see Cabinet Office, Government of Japan 2019). The Kashiwa-no-ha's smart city project applied to be part of the Smart City Pilot Model Programme and succeeded in doing so (cf. MLIT 2019). The central object of the application to this funding programme is the InnovationField Kashiwa-no-ha,

which was founded at the end of 2018 and has been in operation since the beginning of 2019. It will be included in the updated masterplan (Interview 07, Annex 4).

InnovationField Kashiwa-no-ha is to involve and promote the creation of new industry in the project area. It focuses on two business fields, AI/IoT and Life Science/Medical. The Kashiwa-no-ha IoT Business Co-Creation Lab was established in connection with the first business segment and has built a consortium comprising Kashiwa City, the UDCK, DroneWorks Inc. (a local company established through KOIL/31Ventures), and MF (InnovationField Kashiwa-no-ha 2018). The overall target is to promote IoT business in diversified proof fields through PPAP collaboration using Microsoft Azure as a basis. Technology companies will be able to test their products in the urban living lab Kashiwa-no-ha and on its residents. The roles of the actors involved are distributed as follows: Kashiwa City is to point out urban development challenges and install antennas in the area; the UDCK organises the relationship between residents and tech companies; DroneWorks Inc. serves as an intermediating actor between tech companies and the consortium itself; and MF provides test fields (InnovationField Kashiwa-no-ha 2018). As MF, the main developer, owns most of the buildings and land in Kashiwa-no-ha, this makes it easier for companies to test new products or services in an actual city (Interview 07, Annex 4). Less bureaucratic effort is incurred through centralised planning sovereignty in the form of the private developer.

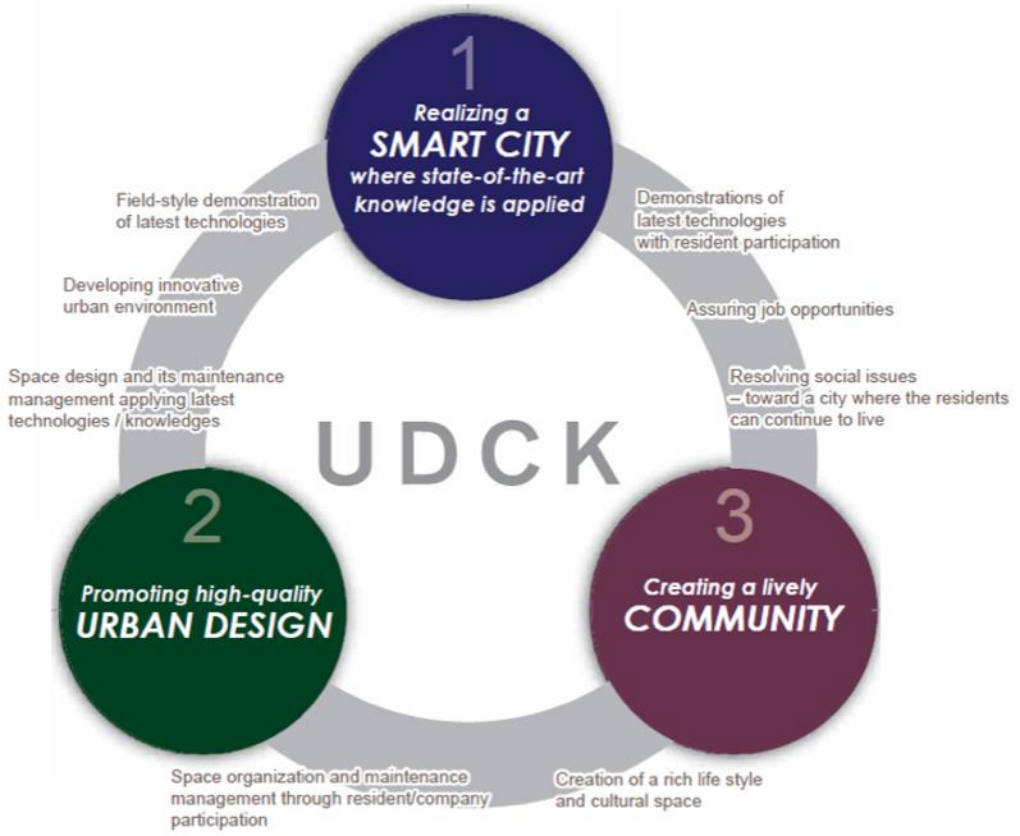

Figure 32 The UDCK's new main activities for the project phase 2020-2030 (Source: UDCK 2019).

Concerning InnovationField Kashiwa-no-ha (2019), a data collaboration platform that integrates private and public data to drive town development is planned; however, the UDCK does not plan to use it for citizen participation and decision-making.

Rather, the UDCK is planning to let the citizen data be analysed by the IoT Business Lab consortium to derive strategies for town development and for public and private services. Furthermore, the UDCK is convinced that Microsoft, with whose help Azure Systems will implement the InnovationField, will not achieve planning sovereignty in Kashiwa-no-ha, as the consortium will be involved throughout the process (Interview 11, Annex 4). The UDCK has already updated its pamphlet and has set the realisation of Society 5.0 and urban living lab experiments on behalf of tech companies as the first task of the new agenda (Figure 32). Furthermore, the UDCK has founded another *Ippan Shadan Hōjin*, the UDCK Town Management General Incorporated Organization, for the operation and management of public space solely in 2019 (UDCK 2019). It can be assumed that this is related to the real laboratory approach to be expanded. On the other hand, platforms such as the Machizukuri school are no longer mentioned (UDCK 2019).

The first space-effective implementation of the InnovationField Kashiwa-no-ha IoT Business Co-Creation Lab has already taken place. Its first area-effective implementation occurred with the installation of sensors for time and water-level measurement at the Aqua Terrace. In the future, these sensors will be connected to the locking system so that Aqua Terrace can be opened and closed depending on the time of day and water level. Currently, this service is provided by people from adjacent Kashiwa Tanaka, who have received this task as an integrative measure within the community-building of Kashiwa-no-ha Smart City.

4.2 Summary of Findings and Normative Governance Analysis

In what follows, the results of the descriptive analysis are broken down into their essential components and summarized in order to compare them with the defined normative Smart Urban Governance indicators. All indicators are equally weighted. Building on this, the central research question of this thesis is answered and strategies for action are provided on the basis of a SWOT analysis for the period 2020–2030 for the Kashiwa-no-ha smart city project.

4.2.1 Social empowerment

Regarding open government data, Kashiwa-no-ha meets nearly all of the criteria set by the indicator (Figure 36; see Table 5, Annex 6 for further details). All administrative entities such as Kashiwa City and Chiba Prefecture and the intermediator, the UDCK, as well as the developer MF provide useful digital and analogue data in form of documents on urban planning, operation, budget, strategy, statistics, and common news. According to several experts (Habenstein et al. 2016: 54–55; Jaekel 2015: 27; Meier/Zimmermann 2016: 5; ; Pereira et al. 2018: 1; Walser/Haller 2016: 19; Zhilin et al. 2019: 88), this open government data should strengthen the position of citizens and give them the opportunity to participate or better to lead to participation. There are several reasons that Kashiwa-no-ha's participation structure is limited and that it has evolved into its current form.

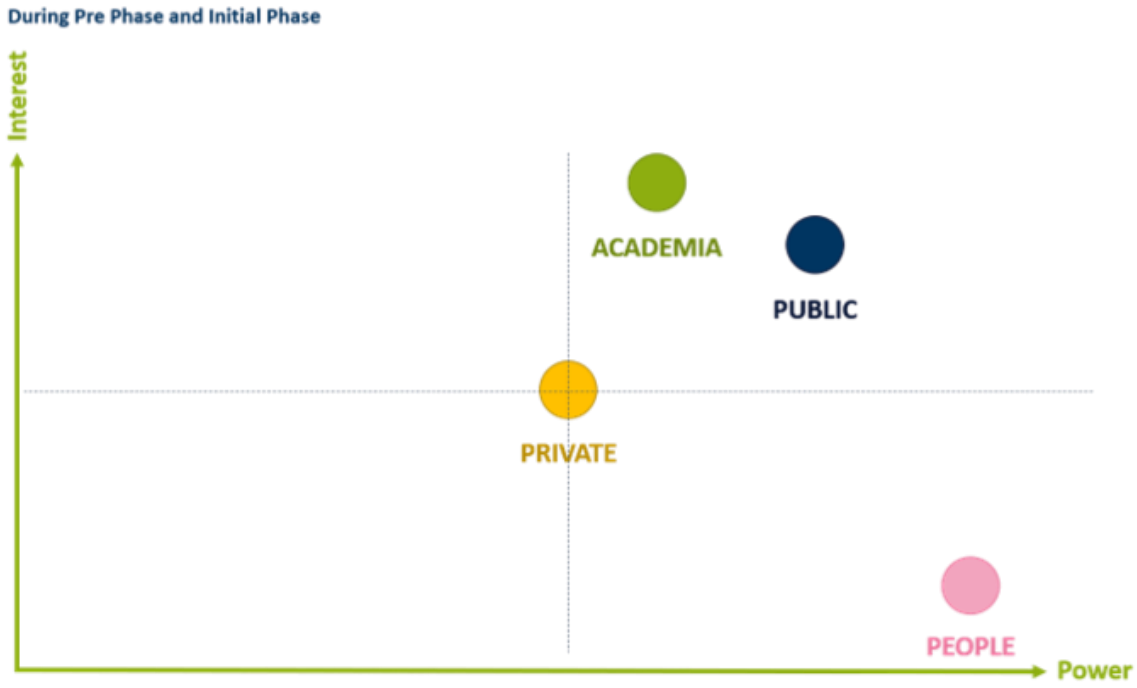

Figure 33 **Stakeholder diagrams on pre and initial phase of Kashiwa-no-ha Smart City. Own representation.**

During the initial stakeholder consultation process, the opinion of the civilian population (landowners) was taken into account and included in the decision-making process from the outset, as they had to be won over for the land readjustment process (Figure 33). Most of these residents living close to the project area had no strong interest in the smart city project though they did in the development of their land within the project area and actively accepted the offers of participation. The common motive for action was mutual dependency in relation to the task of compiling a development plan for the former UCA, which was triggered by the construction of the TX, an exogenous driver.

With the beginning of the first planning, organisation, negotiation, and implementation phase, the UDCK was also launched. After Chiba Prefecture had built the first public infrastructure and the developer, MF, had built the first residential and shopping facilities, community-building was at the agenda. This was promoted by the leadership of the UDCK with the help of all the actors. The civilian population of Kashiwa-no-ha Smart City is now first of all made up of families and young professionals from the Tokyo area as well as former landowners and people from the Kashiwa City area. Together with meticulously pursued community-building through numerous interventions by the UDCK (which, however, usually does not go beyond top-down citizen sourcing and thus remains at a level of participation based on partnership, see Arnstein 1969: 217), the interest of the inhabitants in participating in Kashiwa-no-ha generally increased, though this was primarily among the long-established inhabitants. As a result, this led to a self-initiated reduction in power, which was primarily due to the new residents who use Kashiwa-no-ha more as a service and commuter city and therefore feel no need for action (Figure 34).

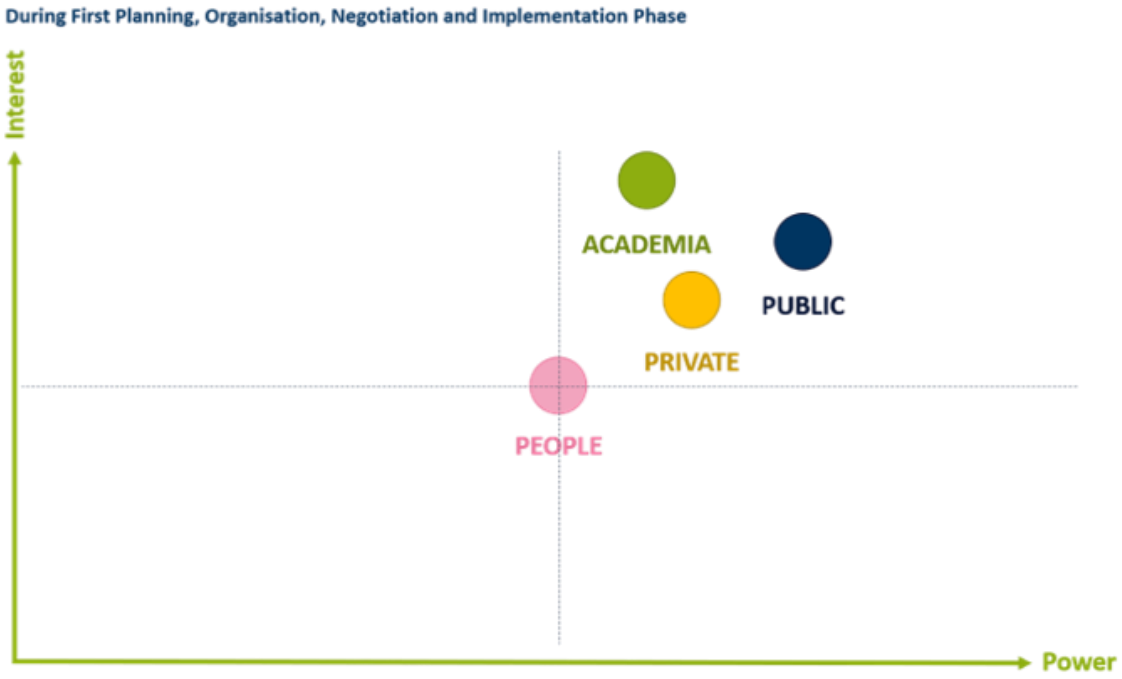

Figure 34 **Stakeholder diagrams on first planning, organisation, negotiation and implementation phase of Kashiwa-no-ha Smart City (Own representation).**

According to Hohn (2000: 515f.), *machizukuri* can be divided into four types using the *Hirohara* model. The *machizukuri* that the UDCK is striving for in Kashiwa-no-ha lies between community-building and simple participation, both of which are typical for areas without problem pressures. However, due to the fact that there is no problem pressure, residents' interest in participation is largely lacking (ibid.: 541). In the course of the second planning, organisation, negotiation, and implementation phase, which is still ongoing, the UDCK has missed the opportunity to animate the local inhabitants to a higher level of participation (Figure 35). Apart from isolated bottom-up approaches such as the Aqua Terrace Event (which can be classified as DIY urbanism and therefore as delegated power, cf. Arnstein 1969: 217), which have been implemented to a greater extent by older and more established and to a lesser extent by new residents, a dilemma is looming.

On the one hand, the UDCK seems somewhat resigned to the lack of pro-active participation on the part of the residents of Kashiwa-no-ha and therefore is not considering the renewed involvement of civil society in the decision-making processes of local urban development (cf. Hohn 2000: 541). On the other hand, community-management is displacing community-building as a capitalistically driven motive for action in the second implementation phase. This is due to economic and planning pressure resulting from the fixed project duration and the goals set during this period. The *Yatai* project represents this circumstance in a nutshell. Nonetheless, the project has to be reproached for the fact that, regardless of the comparison with the Smart Urban Governance indicators, project managers have set themselves the goal of establishing a self-determined and self-governing community.

Figure 35 **Stakeholder diagrams on first planning, organisation, negotiation and implementation phase of Kashiwa-no-ha Smart City. Own representation.**

Participation also interacts with the generation of social capital. According to the Jaekel (2015), Meier/Zimmermann (2016) and UN (2019), actors with planning sovereignty should provide multifunctional and easily accessible public places and, furthermore, according to Zhilin et al (2019: 88), should give residents the opportunity to appropriate those public places and thus shape them. The problem is that through the top-down implementation of community-building, facilities (libraries, meeting rooms, communal kitchens, etc.) have been created, but, with a few exceptions (Aqua Terrace and Gate Square), these are explicitly reserved for the residents of the residential complexes where these facilities are located. Thus, the social capital that can be formed is very limited (cf. Bourdieu 1983: 183–198), which is reflected in the level of participation. Since the residents have not been involved in the decision-making process for the urban development of Kashiwa-no-ha Smart City for the reasons mentioned above, such important, public, and appropriable places have not yet been created. The result is the spatial distortion that has prevailed to date, which is shown by the fact that the project city lacks public facilities (community halls, a public library, nightlife facilities as well as public facilities to gather and meet beyond the blocks) that are self-evident in 'naturally grown' cities.

In summary, the involvement of the residents as private actors in the decision-making process has moved further into the background over the course of the project. This is particularly problematic in view of the planned handover of the UDCK community organisation to the residents after the implementation of the project. Even during implementation, the urban structure that has been created shows deficits which can be attributed to the lack of involvement of the residents in the decision-making process. However, individual UDCK initiatives, such as the K-Salon and the Machizukuri School, have led to the establishment of bottom-up structures which appropriate the space (Aqua Terrace event) beyond the possibilities provided by the

developers (community-building council events, etc. see Field trip 02, Annex 5) and thus draw attention to the spatial deficits of the smart city. Nevertheless, these offers are informally exclusive, since, for example, due to the working hours outside of Kashiwa-no-ha, the participation of working residents (majority) is impossible. This leads to ambivalence among retired residents who participate in the programmes but fail to implement them because the young residents are not available. A digital platform solution may help here.

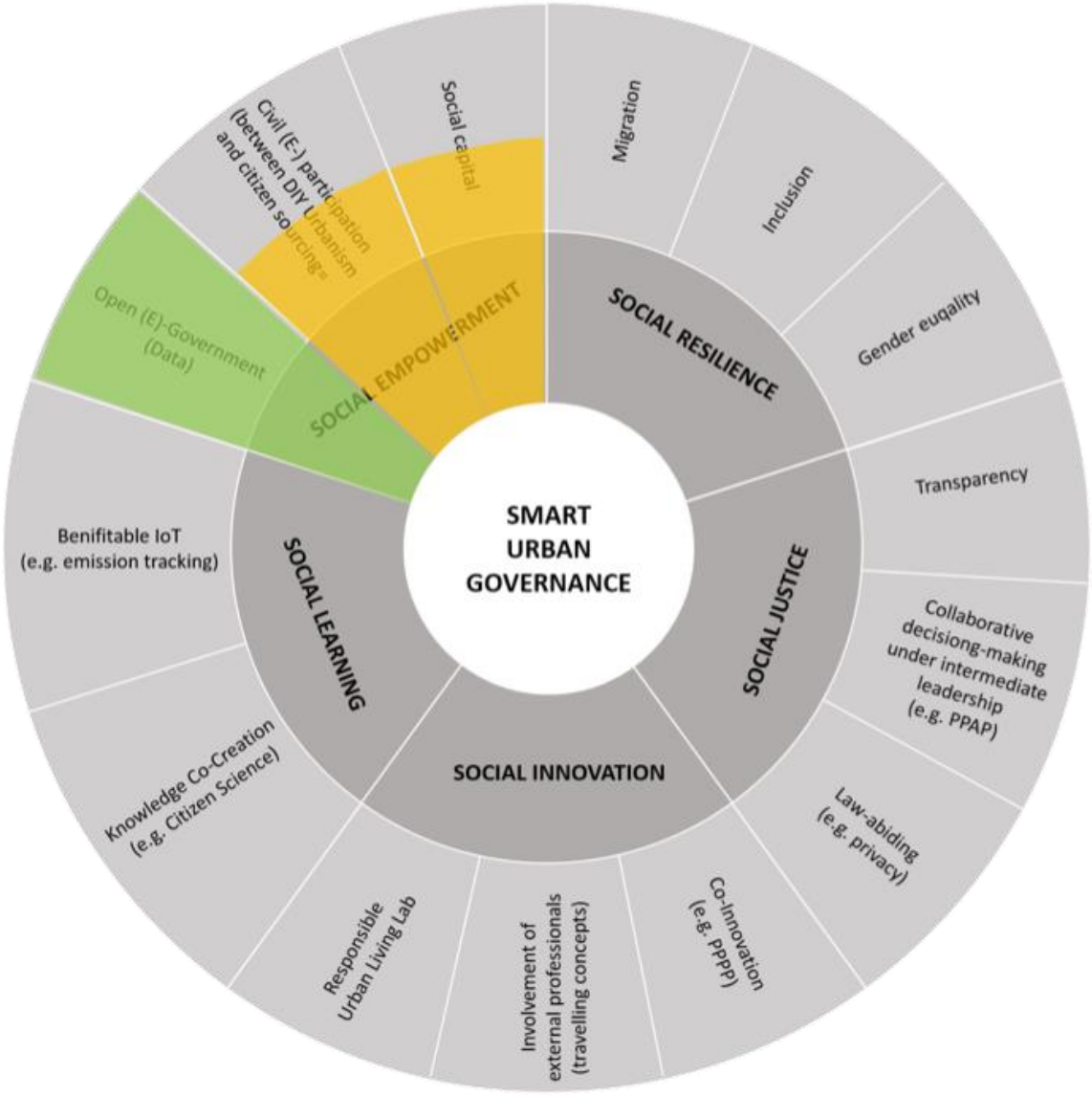

Figure 36 **Social Empowerment indicators fulfilled by Kashiwa-no-ha Smart City. Green means the indicator has been 'completely fulfilled', yellow means it 'needs improvement', and red means it has 'not been fulfilled' (Own presentation and content. Design is inspired by Cohen 2012).**

All in all, Kashiwa-no-ha fully meets the open government data indicator. As far as civil (e-)participation and the generation of social capital are concerned, the project still shows room for improvement – or it should consider a return to old ideals. Overall, the cornerstones of the field of social sustainability are laid in the form of social

empowerment (Figure 36; see Table 5, Annex 6, for further details), but the direction it takes depends on the priorities the actors set in further project management.

4.2.2 Social resilience

'Inclusion' in the sense of cultural diversity and social cohesion through the integration and empowerment of women, immigrants, and socially disadvantaged residents of neighbouring districts, as well as the provision of housing for all age and income groups, is a central component of future urban development (see Badach/Dymnicka 2017: 5; Bosch et al. 2017: 81; Hendriks 2014: 565; Neto et al. 2019: 1356ff.; UN 2019).

In Kashiwa-no-ha, the residential and service opportunities on offer (with the exception of Gate Tower West, which has condominiums only in the higher price segment) mean that there is a concentration of young families and working people between the ages of 30 and 40 living in partnership or singly. The project would be able to address demographic change locally by increasing the birth rate in Kashiwa-no-ha. In comparison, Kashiwa City is characterised by a population with an average age of 50–60 years and lower income, as measured by average rental prices. The decision to initially offer only condominiums is probably related to the fact that the residents are tied to a city under construction. This means that the city currently does not offer enough space for the next generation: the result would be a new, locally concentrated, ageing society. The Gate Tower West, built in 2018, now contains rental apartments, but at prices that young adults cannot afford. The result would be either emigration to the Kashiwa City area - what would result in a socio-demographic revaluation effect for the districts, which would be positive - or, and this is equally likely - the young generation will move into rental apartments available in Tokyo due to demographic changes. In that case Kashiwa City will miss out on its potential. It is therefore to be expected that further rentable housing units will be added in Kashiwa-no-ha in the future.

The positive integrating effect of the project city is that residents from the surrounding districts of Kashiwa City, for example, Kashiwa Tanaka, have found jobs in the smart city. They are also beneficiaries of facilities such as the ASHITA Healthcare Center in LaLaPort and the nearby Aqua Terrace. In addition to Kashiwa City, many other Japanese cities are now benefiting from UDCs that have been implemented as a travelling concept. The problem, however, is that the lack of participation by young and working residents in Kashiwa-no-ha makes it difficult to create cohesion between the residents of the smart city and the rest of Kashiwa City. Therefore, there is still room for improvement in the area of inclusion.

The UDCK is aware of this deficit and has created a central NPO with the Pinocchio Project, which will gain increasing importance, especially in the course of the project's consolidation. The interviews demonstrate that the next generation of today's residents is already showing an increased willingness to participate. Many former participants in the Pinocchio Project are now employees or volunteers of the NPO. VIVITA, which operates independently and not under the leadership of one of the local, traditional actors, is achieving similar success (for example the roller coaster built by children participating in the project and their parents as part of the Aqua Terrace event).

Kashiwa-no-ha offers local employment opportunities, for example, within the framework of KOIL/31Ventures, which enable women to combine work and motherhood. The UDCK and MF also employ women in important positions. This potential should be further promoted. Due to the exemplary incubation undertakings in this area, the smart city fulfils the indicator of gender equality.

Although the Kashiwa-no-ha actors have set themselves the task of advancing internationalisation, as the title of the master plan for the creation of an 'International Campus Town Initiative' shows, success in the urban area has thus far been limited. Although there are spatial conditions (Kashiwa-no-ha International Village) and programmes (Workshops to Promote Internationalization of the Kashiwa-no-ha Campus Area, Internationalization within the framework of the InnovationField Kashiwa-no-ha), these relate only to highly educated workers and trainees. Even the new immigration law passed at the end of 2018 is unlikely to provide any new impetus in Kashiwa-no-ha. The much greater hurdle, however, is creating the necessary social basis in Kashiwa-no-ha Smart City for successful internationalisation (Kurata et al. 2013: 244). In this context, there are currently no visible signs or indications of a rethink of this matter. In order to be attractive for the permanent settlement of people from abroad (regardless of their academic or professional status) as a resilience strategy to demographic change, much more local ambition must be developed in this area.

The bottom line is that Kashiwa-no-ha Smart City addresses the field of social resilience as part of the social sustainability dimension with its interventions in gender equality and inclusion but still needs to improve, especially in the area of immigration (Figure 37; see Table 5, Annex 6, for further details).

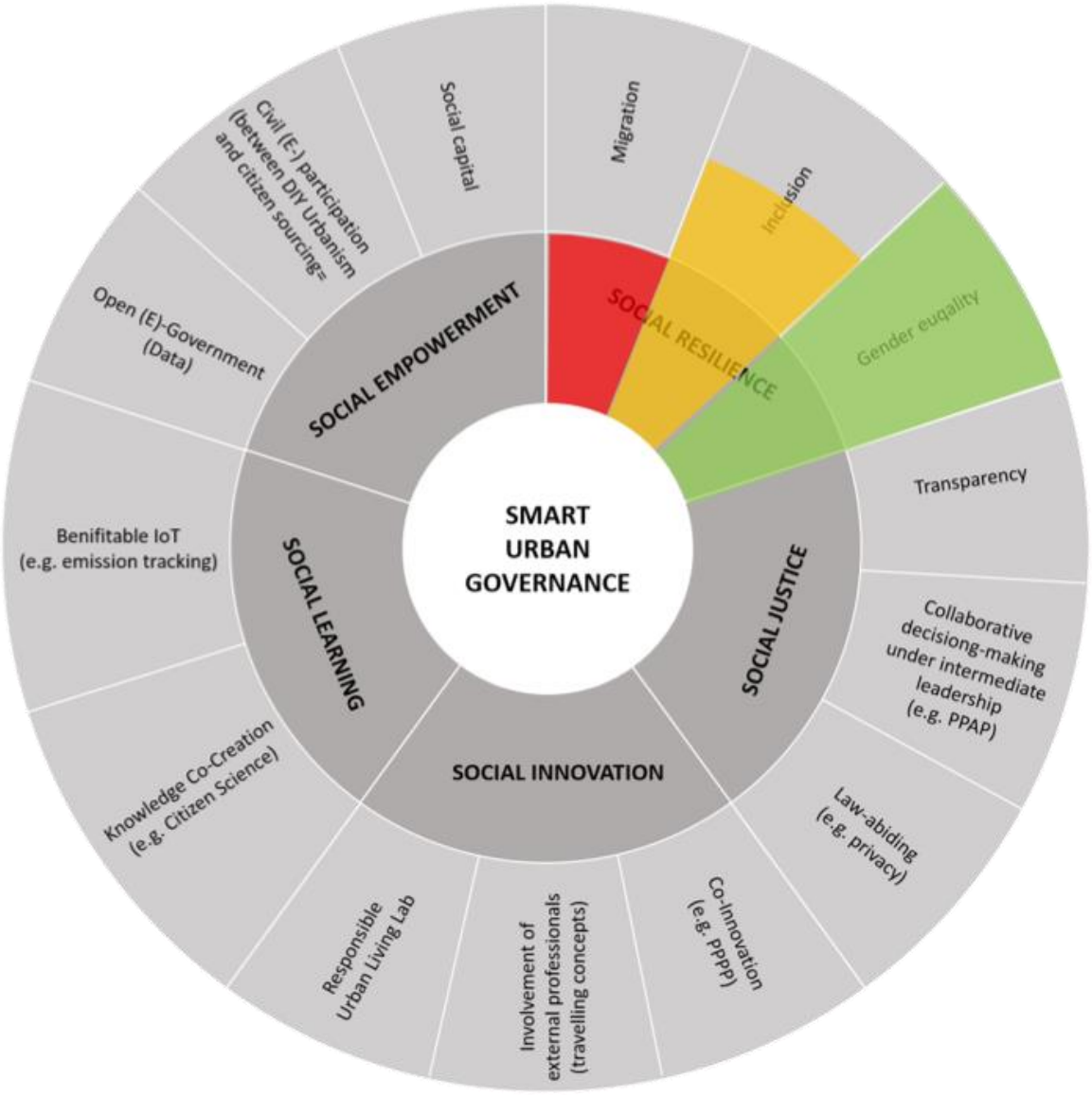

Figure 37 **Social Resilience indicators fulfilled by Kashiwa-no-ha Smart City. Green means the indicator has been 'completely fulfilled', yellow means it 'needs improvement', and red means it has 'not been fulfilled' (Own presentation and content. Design is inspired by Cohen 2012).**

4.2.3 Social justice

The implementation of Social Justice as a field of action of Smart Urban Governance requires the creation of a local culture of recognition, that is, the institutionalisation of counterforces and responsibilities for all actors, offices, and organs that keep one another in check by being transparent and law-abiding (see Bosch et al 2017: 161; Burch 2018: 320f.; Löffler 2001: 212; Pereira et al.; 2018: 1; Sinning 2006: 88-89). Therefore, a mediating entity and the use of digital tools such as ICT can play a vital role making new collaboration models possible between the various actors from individual interest groups (see Hendriks 2014: 16; Romero-Lankao 2012; Schneidewind 2018: 277f; UN-Habitat 2011).

The developer, MF, is responsible for decisions regarding the investment budget and implements private construction measures. Chiba Prefecture assumes the same role,

though only for the public infrastructure. Kashiwa City decides whether a planning draft is appropriate, decides on the administrative rules and has an absolute veto right. The residents are later involved in the implementation or can proactively contact the other actors via the UDCK. In principle, however, any actor in the decision-making process can veto a decision – except for the citizens, who are not part of the decision-making process. The UDCK acts as a moderator to facilitate joint decisions. The UDCK cannot be assigned to the position of the classical, the neo-, nor the para-intermediary actor. This is also manifested in the two subdivided bodies (General Incorporated Organisation) for Urban Design and Town Management, which, depending on the type of spatial intervention and taking into account the preservation of the objectives of the master plan, focus on mediation. Although the UDCK does not have the power to make a decision, it does have the power to bring the actors to a final joint agreement and always acts in accordance with the law and set goals. The UDCK can put the proposals of any actor up for discussion. How neutral the UDCK is in its mediation work is, however, very difficult to assess from the outside. From the perspective of the residents there are different opinions. What is certain is that cooperation via the UDCK is voluntary for the participating actors, though this is also forced to a certain extent by the territorial circumstances. The connections between the actors are shown in Figure 38. A detailed table of all the actors, the stakeholder groups to which they belong, and their interests, self-perceptions, and functions in Kashiwa-no-ha can be found in Table 4, Annex 6. The concentration of arrows in Figure 38 indicates the particularly influential actors.

Establishing the universities as new actors with decision-making power in the urban planning of Kashiwa-no-ha by following the ‘third mission’ works very well and is exemplary. Even though the universities have now been included in the actor structure as respected actors, the dissolution of the traditional Japanese planning culture that the project is striving for is only just beginning to be felt. As a private developer, MF remains the most powerful actor in decision-making and skilfully uses the UDCK’s efforts in smart city branding. The local public government, in the form of Kashiwa City and the prefecture of Chiba, follow their usual procedure and are only involved from the outside where planning law requires it. The public actors of the city are very interested in the project, mainly because of its ‘lighthouse’ function and integrated urban development function; however, due to a lack of financial means, dependence on private individuals and universities and the blind trust placed in them is high.

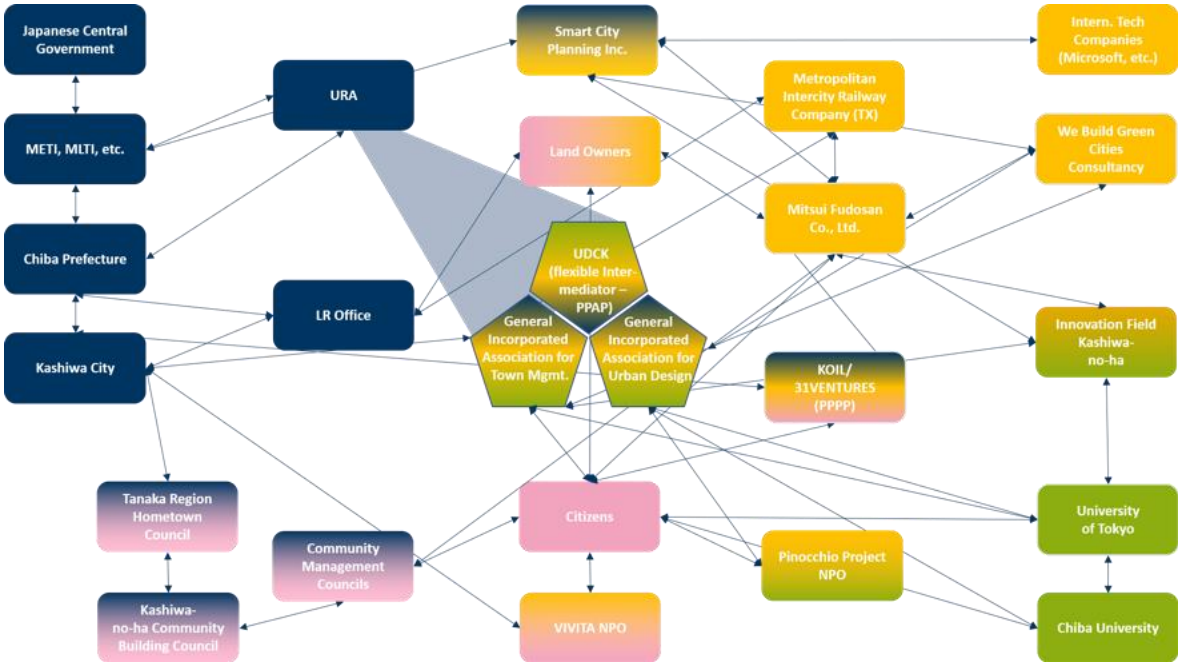

Figure 38 **Kashiwa-no-ha's network of actors (Own representation). Blue stands for public, green for academic, yellow for private, and pink for civil actors. For further details, see Tab. 4, Annex 6.**

Mutual dependence caused by territorial and historical drivers is the central informal institution that enables cooperation between the actors. Communication is primarily face-to-face and therefore still very traditional, which is probably related to the history of the project and its established culture of discussion. With the increasing size of Kashiwa-no-ha and the improvement of ICT, IoT, and AI structures, a shift in the actor structure is expected soon. The project vision/master plan is regarded as a formal institution, but its implementation is usually negotiated informally between the individual actors in face-to-face meetings. Since there are no authentic civilian participants – in the form of an elected citizen in the UDCK roundtable meetings, only a representative of the Tanaka Region Hometown Council (who is invited only on special occasions), which is responsible for the top-down community-building – cooperation between those who have planning sovereignty remains relatively non-transparent for the residents. This also applies to the participation opportunities provided, which are available but apparently not communicated clearly enough to the residents.

Nevertheless, a significant reform of the Japanese planning culture has been established with a flexible intermediary actor in the form of the UDCK. This entity has developed a planning culture of readiness for discussion and compromise among all local actors, which has necessitated the breaking up of national cultural conventions. Since sustainable urban development is of high interest for the Japanese government, the rapid spread of the Urban Design Center concept as a 'travelling concept' throughout Japan is therefore a logical consequence. However, it must be borne in mind that innovative cooperation between the actors in Kashiwa-no-ha is based on local-territorial and historical drivers which, as exogenous and endogenous forces, have essentially promoted mutual dependence and the will for horizontal coopera-

tion. In this context, it remains to be seen whether the UDC concept can be successfully implemented and maintained in other Japanese cities that are not planned on the drawing board.

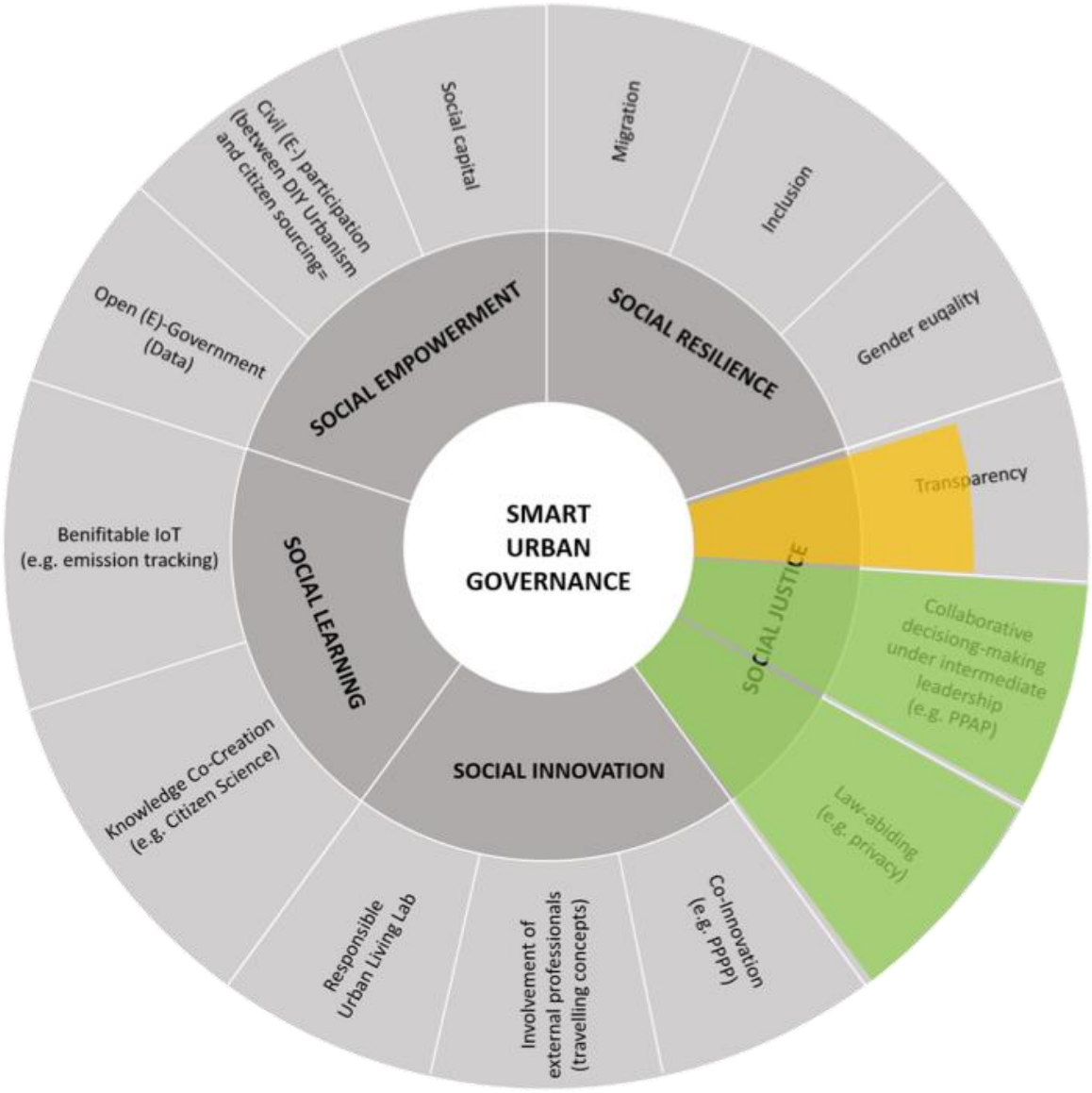

Figure 39 Social Justice indicators fulfilled by Kashiwa-no-ha Smart City. Green means the indicator has been 'completely fulfilled', yellow means it 'needs improvement', red means it has 'not been fulfilled' (Own presentation and content. Design is inspired by Cohen 2012).

In a nutshell, Kashiwa-no-ha smart city fulfils the social justice indicators of collaborative decision-making under intermediate leadership as well as law-abidingness but shows a need for improvement in terms of overall transparency (Figure 39; see Table 5, Annex 6, for further details).

4.2.4 Social innovation

According to Becker (2018: 250); Dewalska-Opitek (2014: 332); Jaekel (2015: 27; Meier/Zimmermann (2016: 5) and the UN (2019), co-Innovation is an innovation process with private participation from both the professional and civil sides. The interaction between digital, economic, scientific, and social structures can either be

combined in the form of a physical top-down facility that works,. for example, as a PPPP or as a bottom-up, for example, FabLabs and HackerSpaces.

Kashiwa-no-ha Smart City seeks cooperation between residents and the universities of Tokyo and Chiba, and between residents and the lead developer MF, to achieve co-production and co-creation with the aim of promoting innovation, so-called Co-Innovation. The KOIL/31 Ventures is a PPPP that offers appropriate participation opportunities for residents through top-down implemented chargeable co-working spaces and free-of-charge FabLabs. KOIL/31 Ventures makes high-tech equipment such as 3D printers freely available to residents in its FabLab and offers rentable co-working office space for entrepreneurs. These interventions are profitable for the residents themselves in terms of achieving explicit knowledge and having impact on their urban living environment, for MF in terms of potential further professional collaboration, as well as for Kashiwa City in terms of tailored solutions from residents for local problems. In addition, MF has a large network of business partners in various industries from which entrepreneurs can benefit if they aim to expand both within Kashiwa-no-ha or Kashiwa City or beyond the city limits. The first cooperation between MF and local entrepreneurs has been concluded within the framework of the Kashiwa-no-ha InnovationField. In this context, spill-over effects on Kashiwa City can be expected. Therefore, KOIL/31 Ventures has an important role to play in innovation creation and related socio-economic capacity-building in Kashiwa-no-ha Smart City.

According Schliwa/McCormick (2016: 174), urban living labs are subspaces of the city in which it is examined how (technological, planning, social) innovations meet socio-spatial reality by allowing various participants to test innovations in real urban life. Bauriedl (2018: 76f) distinguishes between those urban living labs that are seeking possible applications for digital technologies and those that combine the innovations tested there with social reforms. The latter would be a responsible urban living lab approach that offers added value for residents rather than simply using them as test subjects.

In Kashiwa-no-ha, the interaction between the inhabitants and the universities has two dimensions. On the one hand, a socio-economic one within the framework of the urban living lab approach, in which the residents act as test subjects, and a socio-ecological one in relation to knowledge co-creation. Only the latter is dealt with in the following chapter.

During the initial and community-building phases, the urban living lab approach of the smart city project has produced many positive interventions such as the Machizukuri School and the K-Salon, which have become important information platforms for resident participation. In addition, other spatial interventions such as the *Yatai* restaurants were steered by this approach and later firmly established in the urban space of Kashiwa-no-ha, although not yet fully accepted by the residents due to the change of project focus. Furthermore, the UDCK itself is a result of this approach, which is why the urban living lab concept also functions as an argumentative basis that has given the university such a leading role in the network of urban planning actors.

In connection with the recently launched community-management phase, the potential risks of this new project focus are becoming apparent. In this phase, the focus is less on the residents and more on the development of an innovation field and thus on the creation of an investment climate. In this context, Kashiwa-no-ha is also presenting its new internationalisation strategy. The forthcoming revised master plan, the existing update of the UDCK brochure, and the latest presentations by Deguchi (2019) show that in future Kashiwa-no-ha will concentrate on a Society 5.0 strategy that involves numerous AI and IoT companies in the abovementioned project phase. According to the experts interviewed, it is not really the intention to actively involve the residents in the decision-making process but to collect population data in cooperation with local and international technology companies (e.g. Microsoft) in order to derive spatial planning approaches and measure what the residents want. Since private companies already have a strong hand both in Japanese planning culture and in Kashiwa-no-ha, the extent to which such a strategy can serve the common good must be examined. Since the approach of the urban living lab has now been combined with an economic motive for action (which, as indicated, also has understandable reasons), there is a danger, expressed by Bauriedl (2018: 76f.), that Kashiwa-no-ha will develop into a place where technology companies will be able to test their products rather than combining the innovations tested there with social reforms.

A decisive factor in promoting social innovation is the support programmes and deregulation measures granted, which are skilfully implemented by local actors. Travelling concepts can be the starting point for positive, far-reaching changes in local planning. Therefore, they are essential for sustainable urban development based on the defined Smart Urban Governance approach. In combination with external, international consultants, a critical perspective on the creation of local actors can be gained, which ideally leads to the overcoming of planning conformities.

International cooperation with the external consultants of WBGC from Portland in the USA has brought decisive exogenous driving forces to the Kashiwa-no-ha project which have led to the necessary further development of community-building and thus support Kashiwa-no-ha in becoming a model city for sustainable urban development. As a starting point, successfully established integrated sustainability concepts from Portland have been tailored and applied to the local conditions in Kashiwa-no-ha. The spatial results of this collaboration are the use of the deregulation policy granted by the state to activate the inner-city areas and to create multifunctional blue and green infrastructure for public use in the form of the Aqua Terrace. Furthermore, cooperation with the external consultants has led to sustainability certifications according to international standards, which in turn have resulted in the granting of further state subsidies such as the recent Smart City Pilot Model project.

Figure 40 **Social Innovation indicators fulfilled by Kashiwa-no-ha Smart City. Green means the indicator has been 'completely fulfilled', yellow means it 'needs improvement', red means it has 'not been fulfilled' (Own presentation and content. Design is inspired by Cohen 2012).**

In conclusion, Kashiwa-no-ha fulfils the indicators for the involvement of external and extraordinary experts with the intention to derive and apply travelling concepts for overcoming local planning conformities and to promote co-innovation. Concerning the responsible urban living lab, there is currently no need for improvement; however, due to the trends presented in the Society 5.0 masterplan update, a shift to a less responsible Urban Living Lab approach is to be expected (Figure 40; see Table 5, Annex 6, for further details).

4.2.5 Social learning

Social learning is strongly linked to the 'third mission' of universities and also applies to NGOs and NPOs that promote knowledge transfer between these entities and civil society (Dewalska-Opitek 2014: 331f.; Goddard/Vallance 2013: 35f. and 48f.; Jaekel 2015: 60f.; William et al. 2018: 100). This intervention is described as knowledge co-

creation, a mechanism for solution-focused interfaces between academics and non-academics and finds its implementation in, for example, citizen science.

Figure 41 Social Learning indicators fulfilled by Kashiwa-no-ha Smart City. Green means the indicator has been 'completely fulfilled', yellow means it 'needs improvement', and red means it has 'not been fulfilled' (Own presentation and content. Design is inspired by Cohen 2012).

The College Link Program between residents and Chiba University places climate mitigation and sustainability as a whole at the centre of the intervention and thereby contributes to the environmental awareness of participating residents. The Fund for Green supported local NPOs such as Kashihana also develops environmental awareness through their activity in the city and further inspire other residents by their visual appearance in the urban space. Generating environmental awareness goes hand in hand with an IoT that benefits civil society instead of monitoring residents by means of sensory systems and mobile devices. MF provides Kashiwa-no-ha citizens with information on their energy consumption and corresponding CO_2 emissions on both private and public digital signage. Yet it seems that this does not have a considerable influence on consumption behaviour and on the environmental awareness of

many ‘not participating’ residents. Once again, this emphasises the relevance of an awareness tool such as the College Link Program.

In summary, due to the focus of knowledge co-creation in Kashiwa-no-ha on environmental awareness, it fully meets the indicator. The emission tracking system provides a good basis for a beneficial IoT indicator, though there is still room for improvement, especially in view of the Society 5.0 strategy.

5 Conclusion

Can the case example serve as role model for future urban development, based on the definition of Smart Urban Governance that has been provided? This question cannot be answered either affirmatively or negatively (Figure 42).

Figure 42 **Overall presentation of Smart Urban Governance indicators fulfilled by Kashiwa-no-ha Smart City. Green means the indicator has been 'completely fulfilled', yellow means it 'needs improvement', and red means it has 'not been fulfilled' (Own presentation and content. Design is inspired by Cohen 2012).**

On the one hand, the strong or new role of academia (the University of Tokyo) in the urban planning context of Kashiwa-no-ha is exemplary and has led to a collaborative debate culture (the PPAP) between the traditional actors (which is rare in Japan) as well as to an innovative culture between the city and the citizens (a PPPP) and therefore addresses a wide range of related Smart Urban Governance indicators, namely, open government data, gender equality, law-abidingness, the involvement of bilateral consultancy, the application of travelling concepts, and knowledge co-creation. In

this context, Kashiwa-no-ha manages to address in some way every Smart Urban Governance field of action.

On the other hand, there is a need for improvement in every field of action. This is either because a basis has been set only for the respective indicators, which must be expanded in the course of the project in order to achieve Smart Urban Governance (this applies to social capital, immigration, transparency, inclusion and beneficial IoT) or because some indicators have regressed in the course of the project (civil participation and responsible urban living lab).

It should be noted that Kashiwa-no-ha is currently halfway through its implementation phase and therefore that not all of the Smart Urban Governance indicators could be fully met. The project has already laid a promising foundation and has the potential to become a model city for future urban development. As far as the indicators that are in need of improvement are concerned, it remains to be seen whether they will develop in a positive or negative direction by 2030. A final trend compiled with the help of a SWOT analysis, in which the key findings are broken down into strengths, weaknesses, opportunities, and threats (Figure 43).

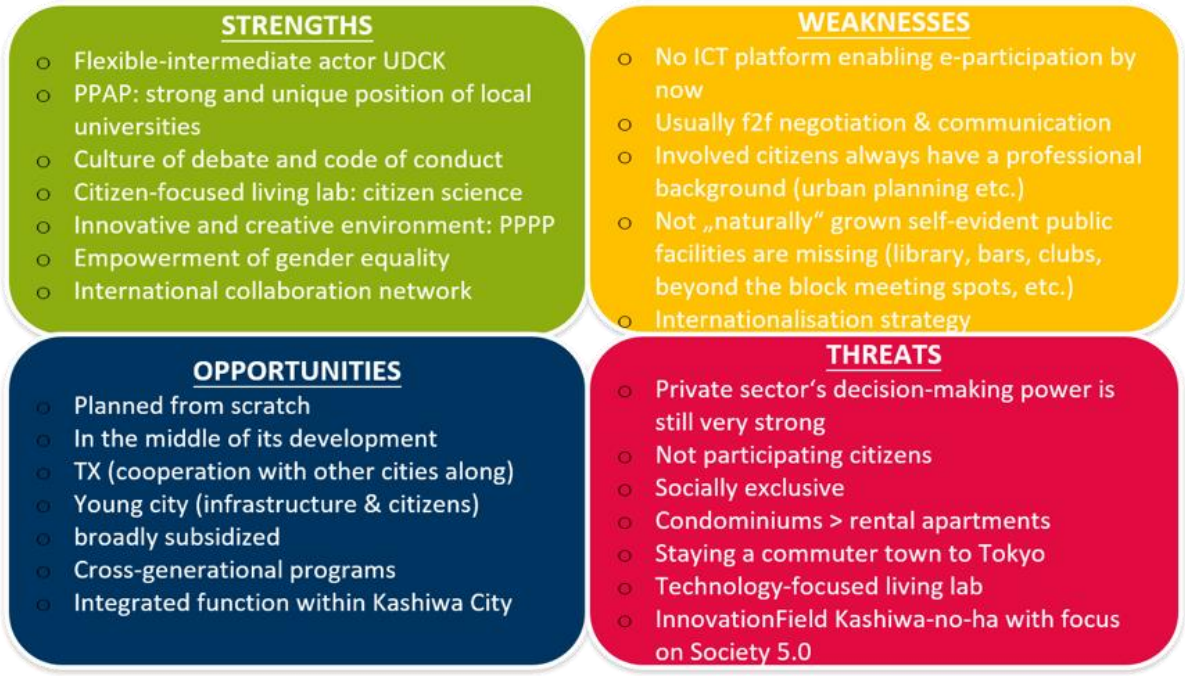

Figure 43 SWOT analysis (Own representation).

With the purpose of steering the project towards a model city for Smart Urban Governance by 2030, a strengths and opportunities strategy should be pursued. This strategy suggests the direct activation of residents through citizen sourcing and DIY urbanism by offering an open data platform to foster bottom-up participation in addition to the involvement in top-down actions as well as their inclusion in the decision-making process to improve transparency. The inputs would support developers in their decision-making and lead the power of the private sector into a more resident-friendly, socially sustainable direction. This is also a prerequisite for self-administration by the residents as is aimed for by the UDCK. Thus Kashiwa-no-ha would become *Kashiha-no-wah* ('one circle Kashiwa-no-ha', Interview 08, Annex 4),

a smart city with an actor network that would actually collaborate as illustrated in the project vision.

The weaknesses and threats prognosis illustrates a dilemma. After considerable time, effort, and money was invested in community-building during the main project phase and the residents therefore initially held an important position in the actors' collaboration network, their position is becoming weaker. This is evidenced by the fact of non-participating and service-oriented residents who perceive Kashiwa-no-ha as a commuter city to Tokyo, as well as by the actors who have the planning sovereignty being driven to ensure the economic viability of the Smart City. The undertaking of the UDCK to make residents not active designers with the help of ICT but passive data providers through AI within the framework of the Society 5.0 strategy is likely to lead to new challenges and cause problems. Kashiwa-no-ha wants to move towards being a Smart City 3.0 (Deguchi 2019), but the project is more likely to become a Smart City 4.0, with all the risks and negative consequences of this.

The Smart City discussion has already shown that if technology dominates, the idea of a social city hangs by a thread (Humann 2019). However, it may be the case that this is exactly what Kashiwa-no-ha needs: a discreetly problematic condition. According to Hohn (2000: 541), *machizukuri* requires crises to be implemented effectively. Thus, the consumer who is always satisfied may suddenly be less satisfied and thus be lured out of his or her comfort zone to become an actively participating resident.

5.1 Reflection

From the author's point of view, the motivation and knowledge goal of the present thesis, to actively contribute to the discourse on the concept of Smart City and Smart Governance by generating new knowledge, has been achieved. Despite the methodological challenges and shortcomings (Chapter 3.3) of this thesis, which are related to the investigation of a foreign planning culture and which have to be considered in view of the meaningfulness of the case study results, it has been possible to address the research interest and its key questions.

It was possible to use the existing geographical and interdisciplinary research literature to derive a definition of smart governance within the fuzzy concept of a smart city. Furthermore, the derived smart governance concept – Smart Urban Governance - has been operationalised by means of a specially developed catalogue of indicators in order to be of further use to researchers and practitioners. The subsequent application of this catalogue led to a theory-based assessment as to whether the Kashiwa-no-ha case study can be regarded as a model for future urban development in the context of the given smart governance definition and its indicators. The evaluation was based on the insights gained about Kashiwa-no-ha's development paths, its actor network structures, their informal and formal rules of play, and the spatial effectiveness of the actors' negotiations, which could be determined by means of the actor- and institution-centred governance analysis scheme, taking into account national and cultural planning particularities.

Nevertheless, it must be acknowledged that the topic selected for this study turned out to be too extensive to be dealt with adequately within the formal limitations of a

master's thesis. On the one hand, the numerous expert interviews were necessary to gain data for the analysis from the perspective of geographic governance research. On the other hand, it was ultimately difficult to keep the abundance of newly acquired interview data under control in the thesis. Accordingly, the interview material still contains information that has not been used in its entirety in this thesis. In addition, it would be advisable to conduct more interviews with other actors on the basis of the 12 existing interviews to increase the significance of the results. To attain a better understanding, the analysis results would have had to be embedded even more extensively in the Japanese planning context. Furthermore, every new insight gained in the field led to further, deeper questions which could not be pursued any further due to the framework in which the survey took place.

5.2 Outlook

Based on the results and the lessons learned, this thesis can serve as a starting point for further research. Since Kashiwa-no-ha is midway through implementation, the next logical step would be to conduct a follow-up investigation, possibly five years after adoption of the new master plan in 2020 or as an overall review of the governance process after project completion in 2030. A social-constructivist investigation would be germane and insightful, focusing on the residents and their individual spheres of experience, decision-making, and values with the aim of ascertain, for example, how their willingness to participate can be increased. Furthermore, with the research approach of the present thesis, a comparison could be made between the UDCK and UDC2 with the aim to identify the difference between UDCs of different generations, on the one hand, and the difference between implementation in a greenfield city and a city in the inventory on the other. Since the UDC concept has now spread throughout Japan as a travelling concept, this study could also be extended to a larger scale.

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7 Annex

The annex to this paper has been shortened due to its size. It originally also contains the project description in Japanese and English, exemplary declaration of consent in Japanese and English, qualitative interview guidelines in Japanese and English, encoded interview transcripts as well as protocols and photo records of conducted field trips. If you are interested, you can request the full annex via markus.gornik@posteo.de.

Table 1 Conducted interviews on sight between February 15 – April 15, 2019 (own representation).

#	ACTOR	STAKEHOLDER GROUP	ROLE/INTE-REST/FUNCTION
1	UDCK	Public/Private/Academic	Flexible-intermediate, negotiate, discuss, director and only fulltime staff
2	Chiba Prefecture	Public	Master planner, Land Readjustment, infrastructure implementation
3	Kashiwa City	Public	Master planner, negotiations with TMG and landowners, maintenance
4	Mitsui Fudosan Co., Ltd. Co., Ltd.	Private	Urban planner, developer, capitalistic motives, Smart City branding,
5	Pinocchio Project Kashiwa-no-ha	Private	NPO, community-building, social resilience
6	Consultant	Private/Civic	Ex-consultant (architect) for Kashiwa-no-ha urban development, Machizukuri school attendant, pariticipating resident
7	Innovation Field Kashiwa-na-ho	Academic/Private	Collaboration between Mitsui Fudosan Co., Ltd. & UDCK to foster the Urban Living Lab concerning IoT/ICT/AI
8	VIVITA	Private/Civic	NPO, community-building, social resilience, participating resident
9	Participating resident	Civic	Participating resident, Machizukuri school attendant
10	Participating resident	Civic	Participating resident, Machizukuri school attendant
11	UDCK	Public/Private/Academic	Flexible-intermediate, negotiate, discuss, director and only fulltime staff
12	WBGC/ZGF Architects	Private	Masterplanner, consortium of different professions, providing travelling concepts and certificates from Portland in Oregon/USA

Table 2 Conducted field trips on sight between February 15 – April 15, 2019 (own representation).

#	LOCATION	TYPE	GUIDE
1	Kashiwa-no-ha Campus Station	Field trip	independently
2	Ichibangai	Field trip	independently
3	Kashiwa-no-ha Smart City Tour	Field trip	Mitsui Fudosan Co., Ltd.
4	Land-Readjustment Area Tour	Field trip	Chiba Prefecture LR Office
5	K Salon (March)	Event	UDCK
6	Aqua Terrace & T-SITE	Field trip	independently
7	Kashiwa-no-ha Gate Square	Field trip	independently
8	Kashiwa-no-ha Neighbourhood Tour (Nibangai)	Field trip	Nibangai resident
#	LOCATION	TYPE	GUIDE

Table 3 Set of Smart Urban Governance indicators (own representation).

DIMENSION	FIELD OF ACTION	INDICATOR	DETAILED DESCRIPTION
Social Sustainability	Social Empowerment	Open Government (Data)	Government provides useful data (documents on urban planning, operation, budget, strategy, statistics) to the public via respective websites.
		Civil (E-)Participation	Civil Society as a new actor with urban planning decision-making power (ideally with help of ICT). Grade of participation is estimated based on Arnstein's ladder of participation: - Low = Level VI = Partnership (Citizen Sourcing) - Medium = Level VII = Delegated Power - High = Level VIII = Citizen Control (DIY Urbanism)
	Social Resilience	Generation of Social Capital	Existence of public places such as green and blue infrastructure, leisure facilities, libraries, open streets, etc. that can be appropriated by residents (right to the city)
		Immigration	Share of residents with a migration background Facilities/programmes that address residents with migration background Local circumstances like rents, social fabric, etc. that makes it attractive to immigrate
		Gender Equality	Share of women in well payed jobs or leading positions Facilities/programmes that aim to empower women
		Inclusion	Heterogeneous population structure (age, gender, income) Heterogeneous housing options (different sizes, price levels and rental options) Spill-over effects on surrounding city area
		Collaborative Decision-making under intermediate leadership	Local culture of recognition and code of conduct among the actors guided by an intermediator (ideally with help of ICT)
	Social Justice	Transparency	Well-known and comprehensible for general public: - Relationships of the actors to each other - decision making - participation opportunities - implementations

DIMENSION	FIELD OF ACTION	INDICATOR	DETAILED DESCRIPTION
		Law-abiding	No violation of the rights (this also includes data protection)
Social-economic-Sustainability	Social Innovation	Co-Innovation	Interaction between civil society, knowledge-based companies and public administrations in order to produce innovative solutions for mostly local problems: - Top-Down in form of PPPPs - Bottom-Up in form of FabLabs, HackerSpaces,
		Responsible Urban Living Lab	University as a new actor with urban planning decision-making power does experimentation in form of testing innovations in urban space while taking into account transparency and data protection
		Involvement of external and extraordinary experts	- taking advantage of external and/or extraordinary consultancy - receiving and applying travelling concepts - overcoming of local planning conformities
Social-ecologic-Sustainability	Social Learning	Knowledge Co-Creation	Citizen Science: - Universities, NGOs & NPOs promoting knowledge transfer between them and civil society (third mission) - Degree of communicated environmental awareness
		Beneficial IoT	Internet of Things (IoT) that benefits civil society instead of monitoring residents: - measurement and publication of local consumption - measurement and publication of local emissions - healthcare via mobile devices - provision of public WIFI

Table 4 Actors of Kashiwa-no-ha Smart City (own representation).

ACTOR	STAKEHOLDER GROUP	INTEREST, UNDERSTANDING OF ONES ROLE AND FUNCTION
Chiba Prefecture LR Office	Public Administration	Role: Constructor of infrastructure and landowner negotiation Interest: Agreement with Kashiwa City and financial support for construction measures through LR or PPAP Function: Master planner - executive
Chiba University	Academia	Role: Mainly focused on citizens via college link program to establish Citizen Science and further development of master plan Interest: Establishing an international research town as well as next-generation environmental town through PPAP Function: Master planner
Community-Management Councils	Public/Civil	Role: Mouthpiece for residents of Ichibangai/Nibangai/Gate Square Interest: fostering community-building activities Function: top-down participation tool
InnovationField Kashiwa-no-ha	Public Administration/Private Business/Academia	Role: Intermediate between residents and tech-companies Interest: creating a setting for investment for international tech-companies to establish an innovative industry in Kashiwa-no-ha Function: consortium to pursue Society 5.0 strategy with AI and IoT
Japanese Central Government and its ministries	Public	Interest: integrated regional function of suburban Smart City in the context of the greater metropolitan area of Tokyo, that also address national sustainability issues Function: granting subsidies
Kashiwa City	Public Administration	Role: Local government Interest: Revitalization of its urban infrastructure with an integrated function by low costs Function: Master planner
Kashiwa-no-ha Community-Building Council	Public/Civil	Role: Parent organisation to the community-management councils Interest: fostering community-building activities Function: top-down participation tool on a larger scale level

ACTOR	STAKEHOLDER GROUP	INTEREST, UNDERSTANDING OF ONES ROLE AND FUNCTION
Kashiwa-no-ha Open Innovation Lab (KOIL)/31 Ventures	Public Administrations, Private Business, Civil Society	Role: professional and civil entrepreneurship fostering by providing facilities (some of them free-of charge) and sharing business contacts, etc. Interest: open innovation, creating a setting for investment, co-creation Function: PPPP
Landowners	Private/Civil	Interest: private companies seek for capital growth, civil landowners want to support or hinder the project (depends on attitude) Function: inevitable actor who is integrated into the cooperation network due to his land ownership
Metropolitan Intercity Railway (TX)	Private Business	Role: Incubator of smart city project Interest: Operate the TX and economic growth Function: integrated urban development
Microsoft	Private Business	Role: incubator of new technical solutions for urban problems Interest: application of software, data gathering, capital growth Function: IoT/AI supplier
Mitsui Fudosan Co., Ltd.	Private Business	Role: Real estate company Interest: capital growth, commercialisation of the smart city concept - In order to achieve these objectives, the actor is prepared to compromise Function: main developer
Nikken Sekkei Ltd.	Private Business	Role: Architect Interest: Collaboration with ZGF and Mitsui Fudosan Co., Ltd. Function: Developer & Master planner
Pinocchio Project	Private/Academia	Role: NPO Interest: community-building Function: Participation contact point for the youngest generation of residents (social resilience)
Residents	Civil Society	Role: first decision-makers, later only service participants Interest: mixed, a few want to design the city, most just want to use it as a commuter town Function: bringing life to the smart city

ACTOR	STAKEHOLDER GROUP	INTEREST, UNDERSTANDING OF ONES ROLE AND FUNCTION
Smart City Planning, Inc.	Private Business	Role: Consortium Interest: international collaboration for all Japanese Smart City projects Function: first contact for externals Joint Venture founded in 2009 to establish Smart City Project, together with Mitsui Fudosan Co., Ltd. and tech companies
Tanka Region Hometown Council	Public/Civil	Role: Parent organisation to the community-building councils (Kashiwa-no-ha, Kashiwa Tanaka, and more) Interest: fostering community-building activities Function: top-down participation tool on a larger scale level
University of Tokyo	Academia	Role: Mainly carries out the creation of forefront research areas and further development of master plan Interest: Establishing an international research town as well as next-generation environmental town through PPAP to acquire external funding Function: Master planner
Urban Design Center Kashiwa-no-ha – UDCK (General Incorporated Association)	Public Administration//Private Business/Academia	Role: planning and strategy making, spatial design, system construction, community fostering Interest: Establishing an international research town as well as next-generation environmental town through PPAP. Export the brand as a travelling concept. Function: Actor who balances between neo- and para-intermediacy and collects information, people, activities and topics.
Urban Renaissance Agency	semipublic Independent Administrative Institution	Role: Stakeholder consultation process Interest: integrated urban development Function: incubator of cooperation between local actors
VIVITA	Private/Civil	Role: NPO Interest: community-building, co-creation social resilience Function: fostering young residents of Kashiwa-no-ha to become the smart city's creative society

ACTOR	STAKEHOLDER GROUP	INTEREST, UNDERSTANDING OF ONES ROLE AND FUNCTION
We Build Green Cities (WBGC) Prosper Portland, ZGF Architects, Glumac, Murase Assoc., EcoNorthWest	Private Business	Role: Consultant Interest: export/sell eco district concept to actors of Kashiwa-no-ha Function: Development of master plan, Architects, LEED certification Collaboration with Chiba Prefecture/Kashiwa City/Mitsui Fudosan Co., Ltd. Co., Ltd./Nikken Sekkei

Table 5 Achieved Smart Urban Governance Indicators by Kashiwa-no-ha Smart City.

DIMENSION	FIELD OF ACTION	INDICATOR	DETAILED DESCRIPTION
Social Sustainability	Social Empowerment	Open Government (Data)	+ Kashiwa City provides useful open data on Kashiwa-no-ha via website + Chiba Prefecture p provides useful open data on Kashiwa-no-ha via website + UDCK provides useful open data on Kashiwa-no-ha via website + Mitsui Fudosan provides useful open data on Kashiwa-no-ha via website
		Civil (E-)Participation	+ During stakeholder consultation process civil landowners were included in decision-making - Currently: less active participation from resident's side, but also no active involvement in decision-making from the actors with planning sovereignty
		Generation of Social Capital	+ Recently public spaces for residents can meet and spend their leisure time has been established (Aqua Terrace, Yatai restaurants) - Already spatial distortion visible, because self-evident public spaces of naturally-grown cities (public libraries, parks, clubs, bars, etc.) are mostly missing
	Social Resilience	Migration	- Selective internationalisation policy that wants to attract academia and highly-professional workers instead of being attractive to immigrants from all social classes - Also no social fabric for an authentic international community
		Inclusion	+ ASHITA and Aqua Terrace play a key role in the social embeddedness of Kashiwa-no-ha within Kashiwa City - Prices for condos and rental apartments are still far above Kashiwa's average and therefore socially exclusive
		Gender Equality	+ Serious attempts to include women by offering flexible occupation opportunities (KOIL, UDCK, Mitsui Fudosan)
	Social Justice	Transparency	+ Cooperation between actors with planning sovereignty seems to be transparent among them - Cooperation between actors with planning sovereignty seems to be non-transparent from residents' perspective

DIMENSION	FIELD OF ACTION	INDICATOR	DETAILED DESCRIPTION
		Collaborative Decision-making under intermediate leadership	+ Flexible intermediator UDCK + Establishment of debate culture + Establishment of code of conduct + Shared vision with help of a masterplan conducted by all actors + Using formal and informal tools for decision-making
		Law-abiding	+ Cooperation is based on commonly shared vision which works as legal basis and every actor follows + LR occurs very law-abiding which is why the project has already a delayed schedule
Social-economic-Sustainability	Social Innovation	Co-Innovation	+ KOIL/31 Ventures serves as PPPP + Offers free-of-charge facilities for innovative co-creation and co-production
		Involvement of external and extraordinary experts	+ Collaboration with WBGC led to improvement of community-building with strong spatial effects (multi-usage inner city passageways, Aqua Terrace, T-SITE) + Therefore, local actors had to overcome national planning conformities
		Responsible Urban Living Lab	+ First half of the project: living lab produced a lot of worthy and powerful area management tools such as Machizukuri School, College Link Program, Yatai restaurants - Beginning of second project phase: with help of InnovationField Kashiwa-no-ha, the smart city strives for becoming a society 5.0 and wants to open their living lab to international tech companies for product tests
Social-ecologic-Sustainability	Social Learning	Knowledge Co-Creation	+ College Link Program with focus on creating environmental and sustainability awareness + Kashihana public gardening association financed by The Fund for Green

DIMENSION	FIELD OF ACTION	INDICATOR	DETAILED DESCRIPTION
		Beneficial IoT	+ Use of IoT for public WIFI, which makes open government data technically accessible to every citizen + Energy consumption and emission data are monitored and shared with residents - First IoT implementations collide with previous socially integrative measures - Society 5.0 strategy orientation will show how beneficial the IoT will continue to be